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ABSTRACT

This curriculum guide contains workplace-specific instructional materials developed for use in a rural workplace literacy demonstration project, specifically with welders. Contents include a student assessment form, instructional objectives, pre- and posttests, learning activities (some locally developed and some selected from commercially prepared materials), and job simulations. Learning activities are provided for vocabulary, comprehension, reference, whole numbers, fractions, decimals, percents, measurements and calculations, interpersonal communication, vocabulary, and information transfer. Answer keys are given. (YLB)

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ED351563

Rural Workplace Literacy Demonstration Project

Welding Curriculum
Dorsey Trailers, Inc.

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Enterprise State Junior College
Enterprise, Alabama

MacArthur State Technical College
Opp, Alabama

Funded by the U. S. Department of Education
Grant VA198A10138

CE062411

CURRICULUM DESCRIPTION

Welder: Dorsey Trailers

Module	Developed by Project	Commercially Prepared
Vocabulary	Preview Basic Definitions Packet Job Simulation: "Rear Frame Blueprint" Review	
Comprehension	Preview Job Simulation: "Dorsey's Power and Hand Tool Safety Handbook" Review	Reading Skills-Machine Tradès, pp. 14-17, 26-19 Reading Skills That Work, Book 1, pp. 85-87
Comprehension	Preview Job Simulation: "Dorsey Rear Bumper Weld On-Blueprint" Review	Reading Skills-Machine Trades, pp. 18-21 JOBS 2000, Book 2, pp. 24-29 Reading Skills That Work, Book 1 pp. 101,102,104,105
Reference	Preview Job Simulation: "Welding Manual" Review	Reading Skills-Machine Trades, pp. 10-13 Appendix F-Using a Table of Contents JOBS 2000, Book 1, Ch. 8
Reference	Preview Reference Activity Packet Job Simulation: "Dorsey Rear Frame Assembly Blueprint" Review	Reading Skills-Machine Trades, pp. 18-21 JOBS 2000, Book 2, pp. 55-73
Whole Numbers	Preview Job Simulation: "Dorsey Blueprint Drawing Number D-42905" Review	Practical Problems in Math for for Welders, Section 1, pp. 1-10

CURRICULUM DESCRIPTION

Welder: Dorsey Trailers

Module	Developed by Project	Commercially Prepared
Fractions	Preview Job Simulation: "Dorsey Blueprint Drawing Number D-42906" Review	Practical Problems in Math for Welders, Section 2, pp. 11-36
Decimals	Preview Job Simulation: "Dorsey Blueprint Drawing Number D-42906" Review	Practical Problems in Math for Welders, Section 3, pp. 37-59
Percents	Preview Job Simulation: "Dorsey Blueprint Drawing Number B-44238" Review	Practical Problems in Math for Welders, Section 4, pp. 71-75
Measurements and Calculations	Preview Job Simulation: "Dorsey Blueprint Drawing Number 42905" Review	Practical Skills for Welders, Section 5, pp. 76-88, 107-109
Interpersonal Communication	Preview Job Simulation: "Dorsey Machine Safety Rules Briefing" Review	Communication Skills That Work, Book 1, Lessons 1,2,3, pp. 3-24
Vocabulary	Preview Welder - Spelling List Spelling Activity Packet Job Simulation: "Dorsey Welder Job Description" Review	

CURRICULUM DESCRIPTION

Welder: Dorsey Trailers

Module	Developed by Project	Commercially Prepared
Information Transfer	Preview Job Simulation: "Dorsey Rear Frame Department Daily Work Sheet" Review	Reading Skills That Work, Book 1, Unit 2, Lesson 4, pp. 25-28 Communication Skills That Work, Book 1, Lesson 11, pp. 83-90

WORKFORCE 2000 (IEP)
Reading - Welder

Name _____

Employer Dorsey

Module	✓	Instructional Objectives	Learning Activities	Job Simulation	Date Assigned	Date Completed	Preview Score	Review Score	Evaluation Comments
Vocabulary	✓	Define job-related vocabulary and abbreviations.	Basic Definitions Packet	Rear Frame Blueprint					
Comprehension	✓	Follow job-specific directions and instructions.	Reading Skills-Machine Trades, pp 14-17, 26-29 Reading Skills That Work Bk 1, pp 85-87	Dorsey's Power and Hand Tool Safety Handbook					
Comprehension	✓	Interpret job-specific rules, regulations, and/or benefits.							
Comprehension	✓	Scan rapidly for job information.	Reading Skills-Machine Trades, pp 18-21 Jobs 2000, Bk 2, pp 24-29 Reading Skills That Work, Bk 1, pp 101,102,104,105	Dorsey Rear Bumper Weld On-Blueprint					
Reference	✓	Locate necessary information in catalogues and manuals.	Reading Skills-Machine Trades, pp 10-13 Appendix F-Using a Table of Contents Jobs 2000, Bk 1, Ch 8	Welding Manual					
Reference	✓	Interpret job-related diagrams, charts, maps and graphs.	Reading Skills-Machine Trades, pp 18-21 Reference Activity Packet Jobs 2000, Bk 2, pp 55-73	Dorsey Rear Frame Assembly Blueprint					

✓ - Represents a need for the instructional objective need based on the job audit.

WORKFC 2000 (IEP)
Writing - Welder

Name [redacted]

Employer: Dorsey

Module	✓	Instructional Objectives	Learning Activities	Job Simulation	Date Assigned	Date Completed	Preview Score	Review Score	Evaluation Comments
Vocabulary	✓	Correctly spell job-related terms.	Welder - Spelling List Spelling Activity Packet	Dorsey Welder Job Description					
Information Transfer		Effectively write notes, memos, reports and business letters.							
Information Transfer	✓	Effectively complete forms and purchase orders.	Reading Skills That Work Bk 1, Unit 2, Lesson 4 pp 25-28 Communication Skills That Work, Bk 1, Lesson 11, pp 83-90	Dorsey Rear Frame Department Daily Work Sheet					

WORKFORCE 2000 (IEP)
Math - Welder

Name _____

Employer: Dorsey

Module	✓	Instructional Objectives	Learning Activities	Job Simulation	Date Assigned	Date Completed	Preview Score	Review Score	Evaluati Comment
Whole Numbers	✓	Recognize place value & define job specific vocab-ulary related to whole numbers. Perform job-related operations - addition, sub-traction, multiplication and division.	Practical Problems in Math for Welders, Section 1, pp 1-10	Dorsey Blueprint Drawing Number D-42905					
Fractions	✓	Define fraction terminology and perform job-related operations with fractions.	Practical Problems in Math for Welders, Section 2, pp 11-36	Dorsey Blueprint Drawing Number D-42906					
Decimals	✓	Recognize place value and define decimal terminology. Perform job-related operations with decimals.	Practical Problems in Math for Welders, Section 3, pp 37-59	Dorsey Blueprint Drawing Number D-42906					
Percents	✓	Define terms related to percents & recognize place value. Perform job-related operations w/percents &/or calculate commissions and interest.	Practical Problems in Math for Welders, Section 4, pp 71-75	Dorsey Blueprint Drawing Number B-44238					
Ratio/ Proportions		Perform job-related operations.							

WORKFORCE 2000 (IEP)
Math - Welder

Name _____

Employer: Dorsey

Module	✓	Instructional Objectives	Learning Activities	Job Simulation	Date Assigned	Date Completed	Preview Score	Review Score	Evaluatio Comments
Mixed Operations		Combine various basic math skills to solve job-related problems.							
Measure-ments and Calcula-tions	✓	Define terms related to workplace measurements. Perform basic operation & conversions using both metric & English measure-ments. Select & use specialized tools (if applicable).	Practical Problems for Welders, Section 5, pp 76-88, 107-109	Dorsey Blueprint Drawing Number 42905					

WORKFORCE 2000 (IEP)

Speaking and Listening- Welder

Name _____

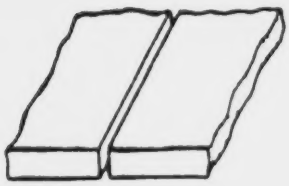
Employer: Dorsey

Module	✓	Instructional Objectives	Learning Activities	Job Simulation	Date Assigned	Date Completed	Preview Score	Review Score	Evaluation Comments
nformation		Select pertinent and obtain missing information in job-related communication.							
Inter-personal Communi-cation	✓	Develop interpersonal communication skills that will be used on the job.	Communication Skills That Work, Bk 1, Lessons 1,2,3, pp 3-24	Dorsey Machine Safety Rules Briefing					

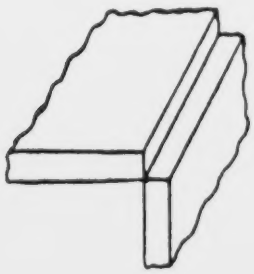
Reading
Vocabulary/Abbreviations
Welder

PREVIEW - DORSEY

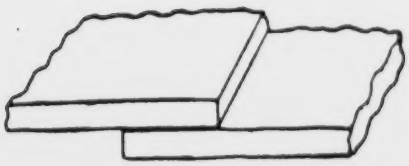
I. Instructions: Label these typical weld joints.



1. _____

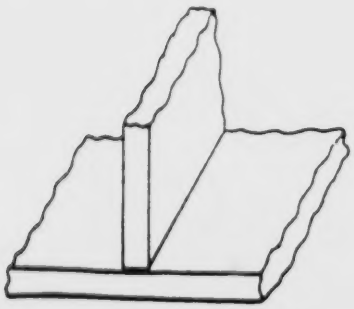


2. _____



3. _____

4. _____



5. _____

II. Instructions: Fill in the blanks.

1. _____ is defined as a growing together or growth into one body of the material being welded.

2. A weld made to hold parts of a weldment in proper alignment until the final welds are made is called a _____ _____.

3. The _____ is the formation on metal following welding.

4. The material that is welded is called the _____.

5. A _____ is the junction of members or the edges of members which are to be joined or have been joined.

6. To _____ is to join pieces of metal.

III. Instructions: Give the standard welding letter symbols for the following. (The first one is done for you.)

1. AWS : American Welding Society

2. _____ : gas tungsten arc welding (TIG Welding)

3. _____ : arc welding

4. _____ : carbon arc welding

5. _____ : gas metal arc welding (CO or MIG welding)

6. _____ : shielded metal arc welding (stick welding)

7. _____ : submerged arc welding (squirt welding)

8. _____ : welding procedure specification

9. _____ : resistance spot welding

WLDOWEPRVA

Reading
Vocabulary/Abbreviations
Welder

PREVIEW - DORSEY

Answer Key

Section I

1. butt joint
2. corner joint
3. lap joint
4. edge joint
5. tee joint

Section II

1. coalescence
2. tack weld
3. bead
4. base metal
5. joint
6. weld

Section III

1. AWS
2. GTAW
3. AW
4. CAW
5. GMAW
6. SMAW
7. SAW
8. WPS
9. RSW

WLDOWEPRVA

BASIC DEFINITIONS

To understand welding it is necessary to be familiar with some of the basic terms used by the industry. The **American Welding Society (AWS)** provides the majority of definitions.

According to the AWS, **welding** is a process that joins pieces of metal together. The growing together or growth into one body of the materials being welded is a **coalescence.**

A **weldment** is an assembly whose component parts are joined by welding. A weldment can be made of many or few metal parts. To produce a usable structure or weldment there must be weld joints between the different pieces that make the weldment. A **joint** is the junction of members or the edges of members which are to be joined or have been joined. The AWS has a set of standardized **welding symbols** which are used to describe the desired weld of a weldment accurately and completely.

It is important to know the difference between the "joint" and the "weld." There are many different types of welds and they are best described by their shape when shown in cross section. The most popular weld is the fillet weld. The second most popular is the groove weld and there are seven basic types of groove welds. There are other types of welds. Joints are combined with welds to make weld joints. (See charts 1, 2, 3, and 4).

There are many different welding processes. They are subdivided into seven groups. **Arc welding (AW)** is the most popular and widely used welding process. **Arc welding** is a process that produces a growing together of materials by heating them with a flow of current across a gap between two electrical terminals. **Carbon arc welding (CAW)** is the oldest of all the arc welding processes and is considered to be the beginning of arc welding.

Currently popular **shielded metal arc welding (SMAW)** process is defined as an arc welding process with an arc between a covered electrode and the weld pool. It was the **submerged arc welding (SAW)** process that made automatic welding popular.

The need to weld metals such as aluminum called for **gas tungsten arc welding (GTAW).** Another welding process related to GTAW is known as **gas metal arc welding (GMAW).** It was developed in the late 1940's for welding aluminum.

Another way of dividing welding processes relates to whether filler metal is or is not used. **Filler metal** is the metal or alloy added in making a welded joint. Selection of filler metals is important; normally, their properties should match the properties of the metal being welded. The metal, called the **base metal,** is defined as the material that is welded.

A type of fusion weld that does not use filler metal is **autogenous welding.** Metal particles expelled during fusion welding which do not form part of the weld are called **spatter.** The **weld bead** is a weld formation on metal resulting from a pass and becomes part of the weld.

It is often necessary to hold parts of a weldment in proper alignment until the final welds are made. This is done by a process called **tack welding.**

As welding becomes an accepted engineering technology it requires that the elements involved be identified in a standardized way. This is accomplished by writing a procedure which is simply a manner of doing or the detailed elements of a process or method used to produce a

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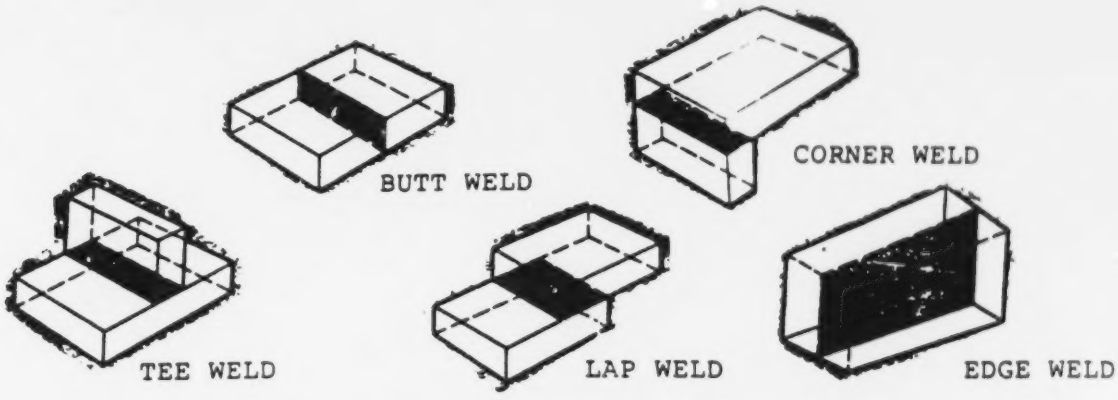
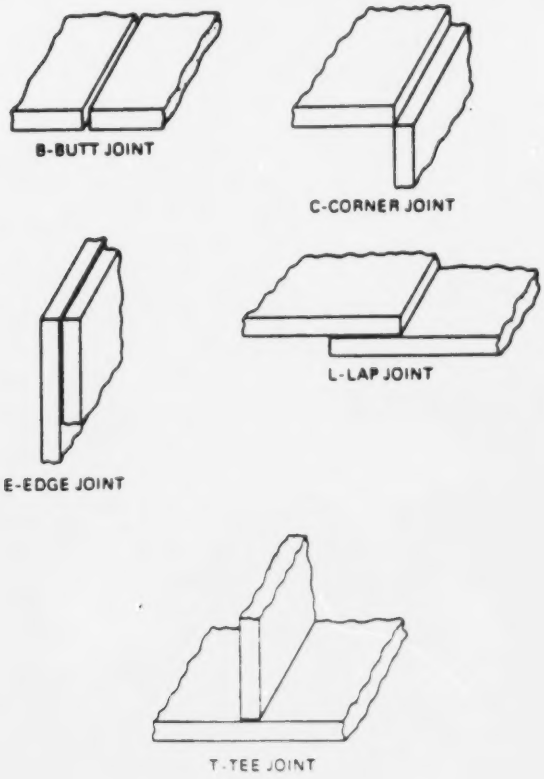
specific result. When welding codes or high-quality work is involved, this can become a **welding procedure specification (WPS).**

TYPES OF WELDED JOINTS

There are five basic types of welded joints specified on drawings. Each type of joint is identified by the position of the parts to be joined together. Parts which are welded by using butt, corner, tee lap, or edge-type joints are illustrated below.

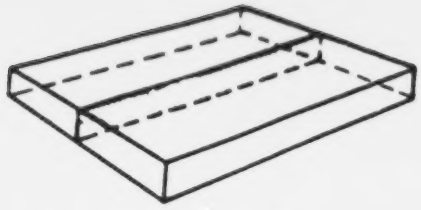


Five basic joint designs.



The joint is "the junction of members or the edges of members which are to be joined or have been joined." There are five basic types of joints for bringing two members together for welding. There joint types or designs are:

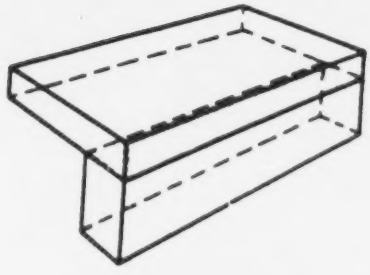
- B, Butt joint: parts in approximately the same plane
- C, Corner joint: Parts at approximately right angles and at the edge of both parts
- E, Edge joint: an edge of two or more parallel parts
- L, Lap joint: between overlapping parts
- T, T joint: parts at approximately right angles, not at the edge of one part



Applicable welds

- Bevel-groove
- Flare-bevel-groove
- Flare-V-groove
- J-groove
- Square-groove
- U-groove
- V-groove
- Edge-flange
- Braze

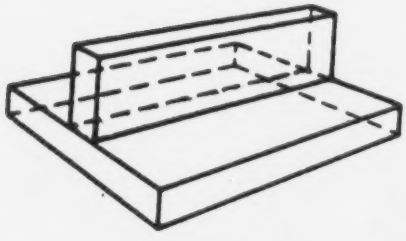
(A) Butt joint



Applicable welds

- Fillet
- Bevel-groove
- Flare-bevel-groove
- Flare-V-groove
- J-groove
- Square-groove
- U-groove
- V-groove
- Corner-flange
- Edge-flange
- Plug
- Slot
- Spot
- Seam
- Projection
- Braze

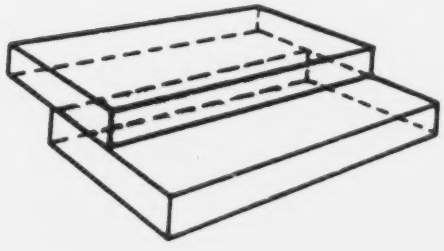
(B) Corner joint



Applicable welds

- Fillet
- Bevel-groove
- Flare-bevel-groove
- J-groove
- Square-groove
- Plug
- Slot
- Spot
- Seam
- Projection
- Braze

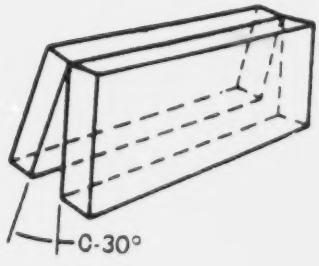
(C) T-joint



Applicable welds

- Fillet
- Bevel-groove
- Flare-bevel-groove
- J-groove
- Plug
- Slot
- Spot
- Seam
- Projection
- Braze

(D) Lap joint



Applicable welds

- Bevel-groove
- Flare-bevel-groove
- Flare-V-groove
- J-groove
- Square-groove
- U-groove
- V-groove
- Edge
- Corner-flange
- Edge-flange
- Seam

(E) Edge joint

JOINTS AND APPLICABLE WELDS

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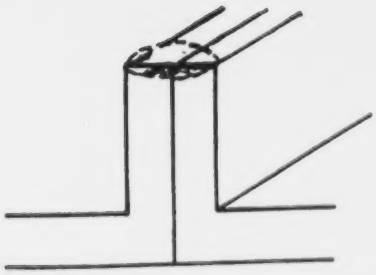
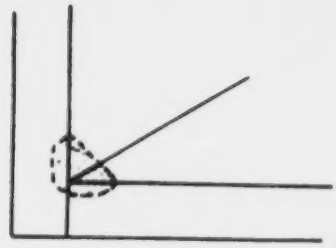
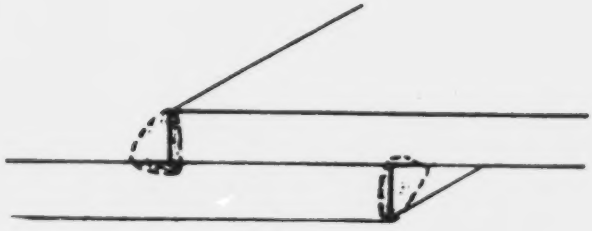
Types of Weld Joints



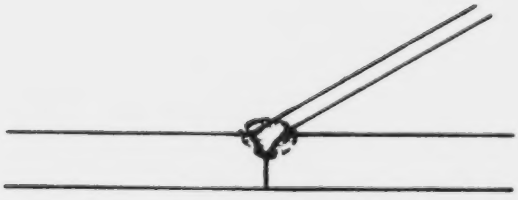
Edge Joint



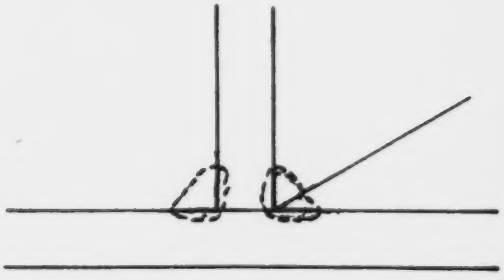
Corner Joint



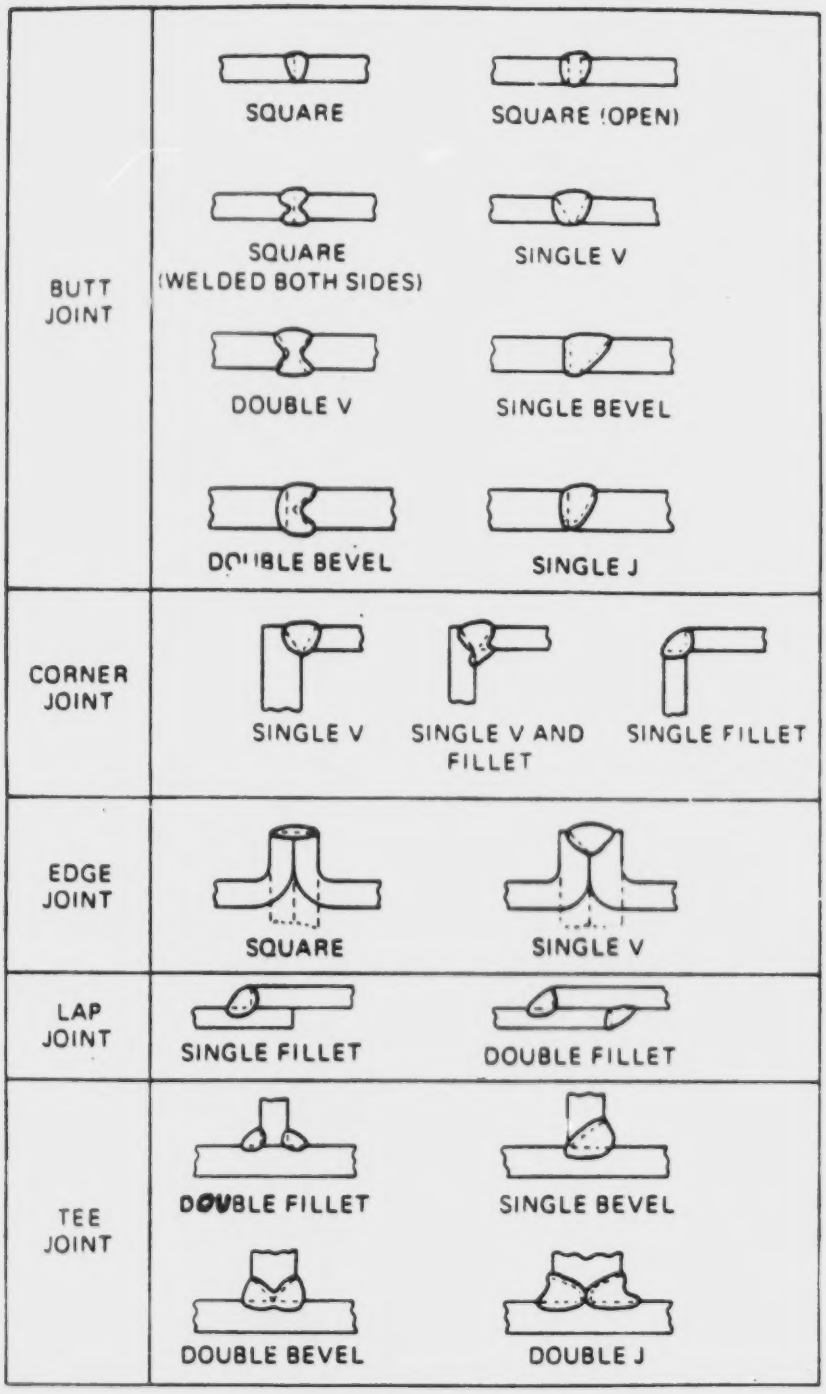
Lap Joint



Butt Joint



T-Joint



Some typical weld joints.

Reading
Vocabulary
Welder

JOB SIMULATION - DORSEY

Instructions: Please answer the following questions. Refer to the Rear Frame Assembly for "87" Vans (Stainless Steel) Blueprint.

1. What type of weld is used for each end of the header?

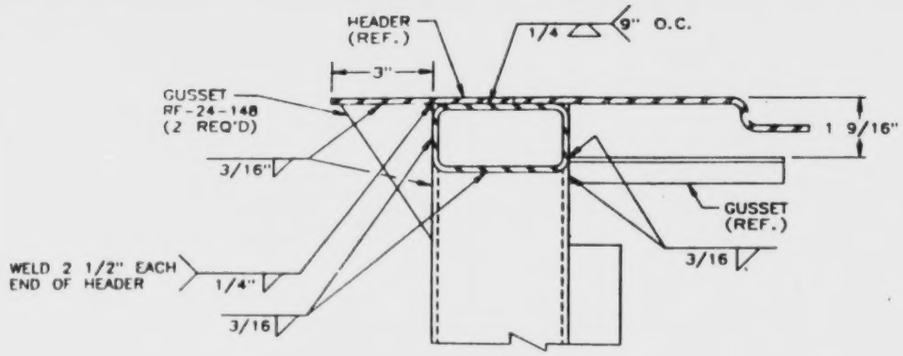
2. Is there a weld on both sides of the headers?

3. What is the length of the header welds?

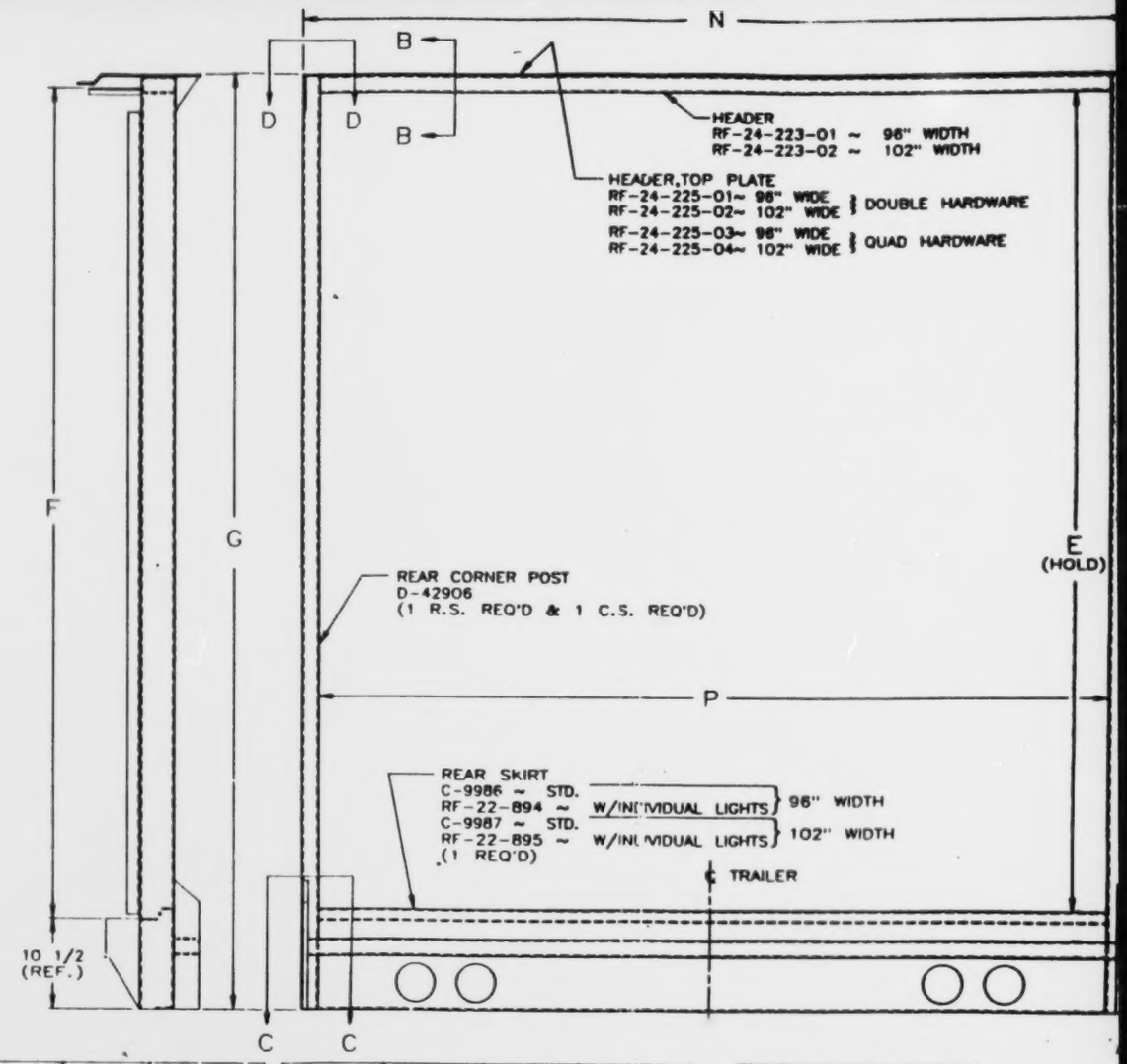
4. How many gussets are requested?

5. Are there any spot welds indicated?

WLDOWEJSVA



SECTION B-B
SCALE: 1/2" = 1"



NOTES:

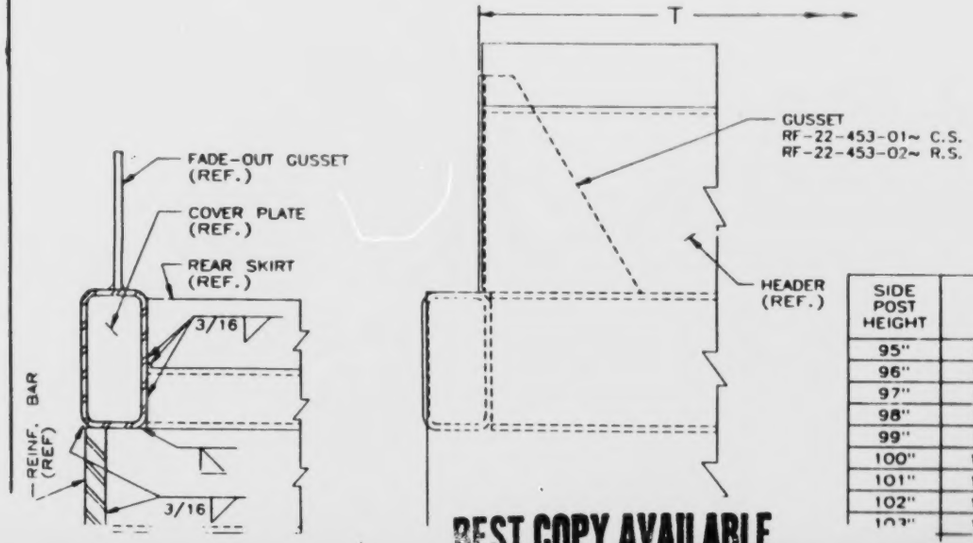
1-SEE DWG. NO. D-42015 FOR UPPER REAR CORNER DETAILS.

2-SEE DWG. NO. D-41389 FOR LOWER REAR CORNER DETAILS.

3-SEE DWG. NO. D-41858 FOR BUMPER STEP INSTALLATION (WELD ON) USE STAINLESS STEEL VERSION.

4-SEE DWG. NO. D-41856 FOR BUMPER STEP INSTALLATION (BOLT ON) USE STAINLESS STEEL VERSION.

5-SEE DWG. NO. D-40174 FOR LIGHT COVER INSTALLATION.



SIDE POST HEIGHT	E	F	G
95"	95"	96 7/8"	108 15/16"
96"	96"	97 7/8"	109 15/16"
97"	97"	98 7/8"	110 15/16"
98"	98"	99 7/8"	111 15/16"
99"	99"	100 7/8"	112 15/16"
100"	100"	101 7/8"	113 15/16"
101"	101"	102 7/8"	114 15/16"
102"	102"	103 7/8"	115 15/16"
103"	103"	104 7/8"	116 15/16"

SIDE POST HEIGTH	E	F	G
107 3/8"	107 3/8"	109 1/4"	121 5/16"
108"	108"	109 7/8"	121 15/16"
108 3/8"	108 3/8"	110 1/4"	122 5/16"
109"	109"	110 7/8"	122 15/16"
109 3/8"	109 3/8"	111 1/4"	123 5/16"
110"	110"	111 7/8"	123 15/16"
110 3/8"	110 3/8"	112 1/4"	124 5/16"
111"	"	112 7/8"	124 5/16"
111 3/8"	"	113 1/4"	125

TRAILER WIDTH	N	P	T
96"	96"	92"	92 11/16"
102"	102"	98"	98 11/16"

2 3/16" FLAT

DORSEY TRAI

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JOB SIMULATION - DORSEY

Answer Key

1. Fillet weld

2. No

3. 1/2"

4. 2

5. No

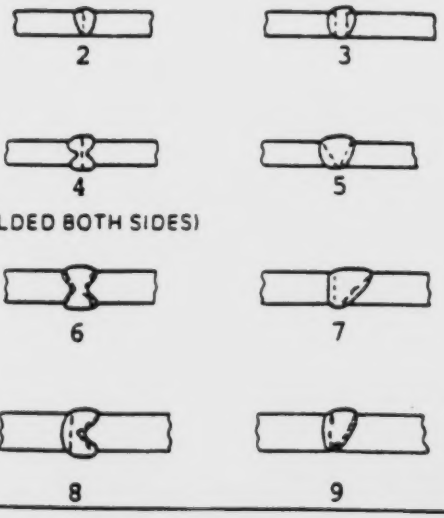
WLDOWEJSVA

Reading
Vocabulary
Welder

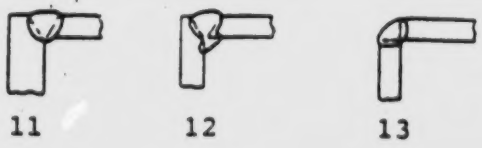
REVIEW - DORSEY

I. A. Label the typical weld joints Numbers 1, 10, 14, 17 & 20.
B. Label one example for each type of joint. You may choose from the list of words given on the next page. Some answers may be used more than once.

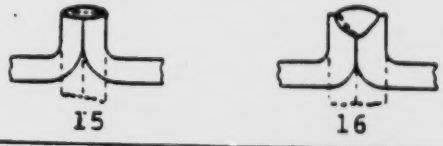
1. JOINT



10 JOINT

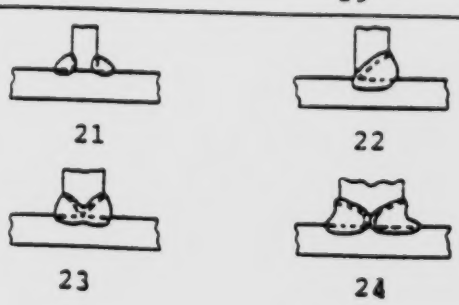


14 JOINT



17 JOINT

20 JOINT



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

Words to choose from to label the weld joints and the examples. Some words may be used more than once.

butt joint
corner joint
double bevel weld
double fillet weld
double J weld
double v weld
edge joint
lap joint
single bevel weld
single fillet weld
single J weld
single v weld
square weld
tee joint
weld joint

II. Instructions: Fill in the blanks. (You may choose from the words listed below.)

welding symbol
weldment
coalescence
autogenous weld
tack weld
arc welding
filler metal
joint
spatter
weld bead or bead

1. _____ is a welding process that produces a growing together of materials by heating them with a flow of current across a gap between two electrical terminals.

2. A _____ is used to describe the desired weld of a weldment accurately and completely.

3. _____ is the metal or alloy to be added in making a welded joint.

4. _____ is an assembly whose component parts are joined by welding.

5. A _____ is the junction of members or the edges of members which are to be joined or have been joined.

6. _____ is a growing together or growth into one body of the materials being welded.

7. _____ is the metal particles expelled during fusion welding and which does not form a part of the weld.

8. An _____ is a fusion weld made without the addition of filler metal.

9. A _____ is a weld formation on metal resulting from a pass.

10. _____ is a weld made to hold parts of a weldment in proper alignment until the final welds are made.

WLDOWEREVA

REVIEW - DORSEY

Answer Key

Section I

1. butt joint
2. square weld
3. square weld
4. square weld
5. single v weld
6. double v weld
7. single bevel weld
8. double bevel weld
9. single J weld
10. corner joint
11. single v weld
12. single v and fillet weld
13. single fillet weld
14. edge joint
15. square weld
16. single v weld
17. lap joint
18. single fillet weld
19. double fillet weld
20. tee joint
21. double fillet weld
22. single bevel weld
23. double bevel weld
24. double J weld

Section II

1. arc welding
2. welding symbol
3. filler metal
4. weldment
5. joint
6. coalescence
7. spatter
8. autogenous weld
9. weld bead or bead
10. tack weld

WLDOWEREVA

Reading
Following Directions
Welders

PREVIEW - DORSEY

I. Directions: Please read the attached information sheets and then decide if the statement is true or false. Record your decision on your answer sheet.

1. T or F Wet ground around a welding job is dangerous.

2. T or F Never look at an arc with the naked eye.

3. T or F To protect your hands from rays and spattering hot metal, always wear rubber gloves.

4. T or F Remove the helmet or shield when chipping slag with a chipping hammer.

5. T or F Modern electrode (rod) holders are completely insulated, including the jaws.

6. T or F Never adjust the welding machine while it is in operation.

7. T or F Drums that served as storage for gasoline are safe for welding as long as they are empty.

8. T or F Tongs or pliers are used to handle hot metal.

9. T or F Trousers (pants) should not have cuffs.

10. T or F Buttermilk is good to drink to overcome nausea caused by inhaling zinc oxide fumes.

WLDOWEPRFD

Reading
Following Directions
Welder

PREVIEW - DORSEY
ANSWER SHEET

I. 1. T
2. T
3. F
4. F
5. F
6. T
7. F
8. T
9. T
10. F

WLDOWEPRFD

Reading
Following Directions
Welder

JOB SIMULATION - DORSEY

Instructions: Please read pages 1-3 and page 13 from Dorsey's Power and Hand Tool Safety Manual and then answer the questions.

1. What must you always wear when using any type tool?

2. Why should you always keep your work within easy reach?

3. What should you always do **before** operating any power tool?

Name two things you should always do when operating a power tool:

4.

5.

WLDOWEJSFD

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INTRODUCTION

The incorrect use of hand tools and portable power tools accounts for a large number of accidents each year, both on the job and at home. Hand and eye injuries head the list; but the range of injuries is great, including broken bones from falls and death from electrocution.

Power tools require some safety measures which do not apply to hand tools. **But whatever type of tool you are using:**

1. WEAR EYE PROTECTION

   Safety glasses with side shields are required for most jobs but if particles can come from any direction, then goggles should be used. People have lost an eye while using a screwdriver!

2. STORE AND CARRY TOOLS CORRECTLY

   Many accidents happen when a tool is not actually being applied. People are injured when they fall carrying a sharp tool, or when they reach into a toolbox. DO NOT put knives or other sharp tools in a toolbox with their blades exposed. Store them separately or with blades covered.

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3. USE THE CORRECT TOOL FOR THE JOB

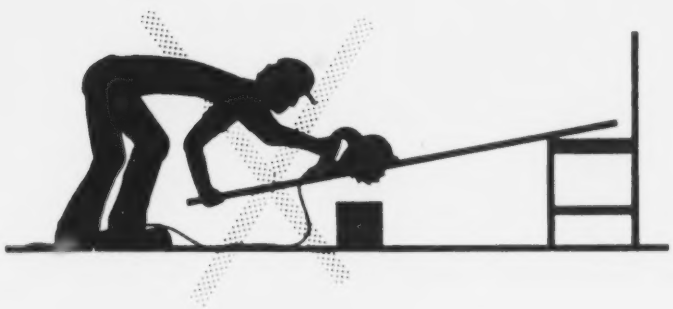
Trying to make due with the wrong tool - especially trying to use a tool that is too small for a job - causes many injuries. DO NOT extend the handles of a gripping or cutting tool! If a tool is making you strain at a job, get a bigger tool. ALWAYS use the bit, blade or cutters designed for the material being worked.

4. KEEP TOOLS IN GOOD CONDITION

Handles should not be loose or cracked. Electrical insulation and wiring must be in perfect condition. Cutting blades must be sharp. Dull tools require too much force. The work gets damaged and people get hurt when the tool binds or slips.

5. SUPPORT THE WORK

Many injuries occur when people are too lazy to use sawhorses, vises or other proper support for the work. DO NOT hold the work with your hand. Make certain the work is on a stable, flat surface. Use clamps when necessary.



6. CONCENTRATE ON WHAT YOU ARE DOING

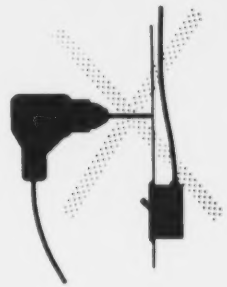
Many people are injured when they get distracted. Always pay close attention to the job!

7. PROTECT YOUR "OFF-HAND"

Gouges from a screwdriver, lost fingernails from a hammer blow, amputated fingers from a power saw blade — many injuries happen to the hand not holding the tool. Know how to use the tool, and keep your free hand clear of the tool.

8. BEWARE OF ELECTRICAL HAZARDS

Make certain that any wiring you might contact is NOT electrically live. When drilling or cutting into walls, beware of wiring inside. And remember that a tool handle is NOT insulated unless it is clearly labeled "Insulated."



9. KEEP THE WORK WITHIN EASY REACH

Whether standing on the ground or on a ladder, DO NOT stretch too far to reach the work. You will not be able to control the tool safely. You could drop the tool. You could fall onto the tool.

Portable Power Tools

Power tools provide considerably more speed and force than manual tools. As a result, injuries involving these tools are likely to be quite serious. A drill bit or saw blade can do a lot of damage quickly.

- Pay close, constant attention when using any power tool.
- Be certain the tool is in good condition.
- Be certain that all parts of the power source are in good condition.
- DO NOT wear loose clothing or jewelry that could become caught in the tool.
- DO wear eye protection.
- DO NOT let either hand get near the operating point of the tool.

Read manufacturer's instructions. Know the correct way to maintain, adjust and operate any power tool before using it.!

Most tools are powered either by electricity, compressed air, or gasoline, each of which can be dangerous. Safe operation of power tools depends upon making certain that the power source does not become a hazard!

Reading
Following Directions
Welder

JOB SIMULATION - DORSEY
Answer Key

1. Eye protection (glasses, goggles)

2. You're unable to control tools safely, you may drop the tool, you could fall onto the tool.

3. Read the manufacturer's instructions.

4. Pay attention

5. Make sure the tool is in good condition, make sure all parts of the power source are in good condition. Don't wear loose clothing or jewelry. Wear eye protection. Don't let either hand get near the operating point of the tool.

WLDOWEJSFD

Reading
Following Directions
Welder

REVIEW - DORSEY

I. Directions: Please read the attached information sheets and then decide if the statement is true or false. Record your decision on your answer sheet.

1. T or F Protective clothing and equipment will prevent accidents and injuries from occurring.

2. T or F Canvas or heavy cotton gloves should be worn to provide protection when welding.

3. T or F Containers that stored flammable liquids may be welded after they are steam cleaned or filled with water.

4. T or F There is never a time to look at the arc with the naked eye.

5. T or F Clothing should be loose and cool when welding due to the heat produced.

6. T or F Buttermilk is good to drink to overcome nausea caused by inhaling zinc oxide fumes.

7. T or F Weld only in a well ventilated area.

8. T or F Dark sunglasses may be substituted for number 10 shade lenses.

9. T or F Wet ground around a welding job is dangerous.

10. T or F As long as others are 10 feet away it is safe for them to look at the arc without protective eye gear.

WLDOWEREFD

REVIEW - DORSEY
ANSWER SHEET

I.
1. F
2. T
3. T
4. T
5. F
6. F
7. T
8. F
9. T
10. F

WLDOWEREFD

Reading
Scan Rapidly for Information
Welder

PREVIEW - DORSEY

Instructions: Please scan the appropriate documents for the following information.

Figure 2-18

1. To what group of welding does Flash Welding belong?

2. How many welding processes are included in the Arc Welding group?

3. What is the letter designation for Shielded Metal Arc?

4. To what group of welding does Ultrasonic Welding belong?

5. What does the letter designation PAW represent?

Information Sheet - Scan Section Three

6. What does the chart show?

7. What should you do if your work is too cold?

8. What electrode size should be used for a metal thickness of 5/16"?

9. What amperage setting is used when a metal is 3/16"?

10. What is probably the metal thickness if the amperage is set on 175?

WLDOWEPRSR

FIGURE 2-18 Popular welding processes and letter designations.

	Welding Process	Letter Designation
Arc welding	Carbon arc	CAW
	Electro gas	EGW
	Flux-cored arc	FCAW
	Gas metal arc	GMAW
	Gas tungsten arc	GTAW
	Plasma arc	PAW
	Shielded metal arc	SMAW
	Stud arc	SW
	Submerged arc	SAW
Brazing	Diffusion brazing	DFB
	Dip brazing	DB
	Furnace brazing	FB
	Induction brazing	IB
	Infrared brazing	IRB
	Resistance brazing	RB
	Torch brazing	TB
Oxyfuel gas welding	Oxyacetylene welding	OAW
	Oxyhydrogen welding	OHW
	Air acetylene	
	Pressure gas welding	PGW
Resistance welding	Flash welding	FW
	Projection welding	RPW
	Resistance seam welding	RSEW
	Resistance spot welding	RSW
	Upset welding	UW
Solid-state welding	Cold welding	CW
	Diffusion welding	DFW
	Explosion welding	EXW
	Forge welding	FOW
	Friction welding	FRW
	Hot pressure welding	HPW
	Roll welding	ROW
	Ultrasonic welding	USW
Soldering	Dip soldering	DS
	Furnace soldering	FS
	Induction soldering	IS
	Infrared soldering	IRS
	Iron soldering	INS
	Resistance soldering	RS
	Torch soldering	TS
	Wave soldering	WS
Other welding processes	Electron beam	EBW
	Electroslag	ESW
	Flow	FLOW
	Induction	IW
	Laser beam	LBW
	Percussion	PEW
	Thermit	TW

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A. Adjusting the Current:

1. A wide range of current is necessary for the various sizes and types of electrodes and for the different kinds of metals and welds used. Arc welders are constructed so that current may be adjusted. The manufacturer's instructions for using the welder suggest the correct current settings to use. These instructions should be followed. It is important to use the proper welding current in order to obtain a satisfactory weld.

2. In using a DC welder, set it to the polarity suggested by the manufacturer of the electrode being used. The machine is set on "straight polarity" when the electrode holder and cable is connected to the negative terminal on the welder, and on "reverse polarity" when the electrode holder and cable is connected to the positive terminal on the welder. An AC transformer type of AC welder does not have polarity.

3. The chart shows the approximate amperage setting for various metal thickness and electrode size. After setting the welder, if the work is too hot, reduce the amperage. If it is too cold, raise the amperage. It will be found that there is considerable allowable latitude in heat for any given-size electrode, which is governed by the thickness of metal involved, speed of travel, and the arc length.

Electrode Size and Suggested Ampere Setting To Be Used When Welding in Flat Position

Metal thickness	1/16"	3/32"	1/8"	5/16"	1/4"	5/16"	3/8"	1/2"
Electrode size	3/32"	5/32"	1/8"	1/8"	5/32"	5/32"	5/32"	5/32"
*Amperage setting	65	80	100	115	130	140	160	175

*The amperage settings given are approximate. It may be necessary to select a higher or lower amperage setting depending on the skill of the operator and welding conditions

You will know that amperage is too high and work too hot when the bead is flat and porous, with considerable spatter along the edge. The electrode (rod) will heat up. Too-low setting of amperage will cause the bead to pile up and produce excessive overlap, with poor penetration. On low amperage, the arc has a tendency to smother out. (See illustration on next page.)

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Reading
Scan Rapidly for Information
Welder

PREVIEW - DORSEY

Answer Key

1. Resistance Welding

2. 9

3. SMAW

4. Solid-state welding

5. Plasma Arc

6. Electrode size and suggested amperage setting to be used when welding in a flat position.

7. Raise the amperage

8. 5/32"

9. 115

10. 1/2"

WLDOWEPRSR

Reading
Scan Rapidly for Information
Welder

JOB SIMULATION - DORSEY

Instructions: Please scan the attached blueprint and answer the following questions.

1. How many views are shown?

2. What is the date of the blueprint?

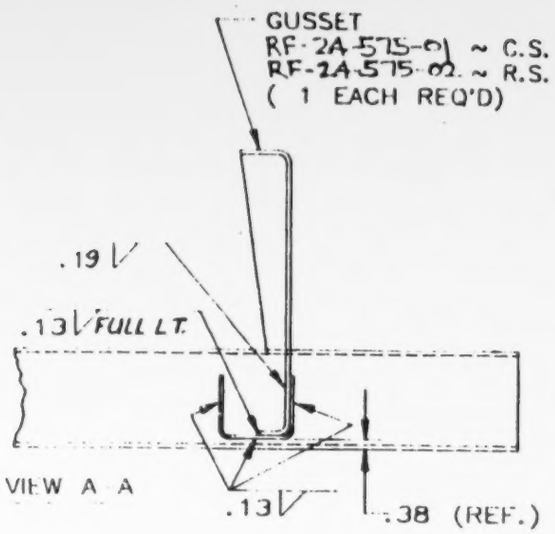
3. How many vertical bumper members are requested?

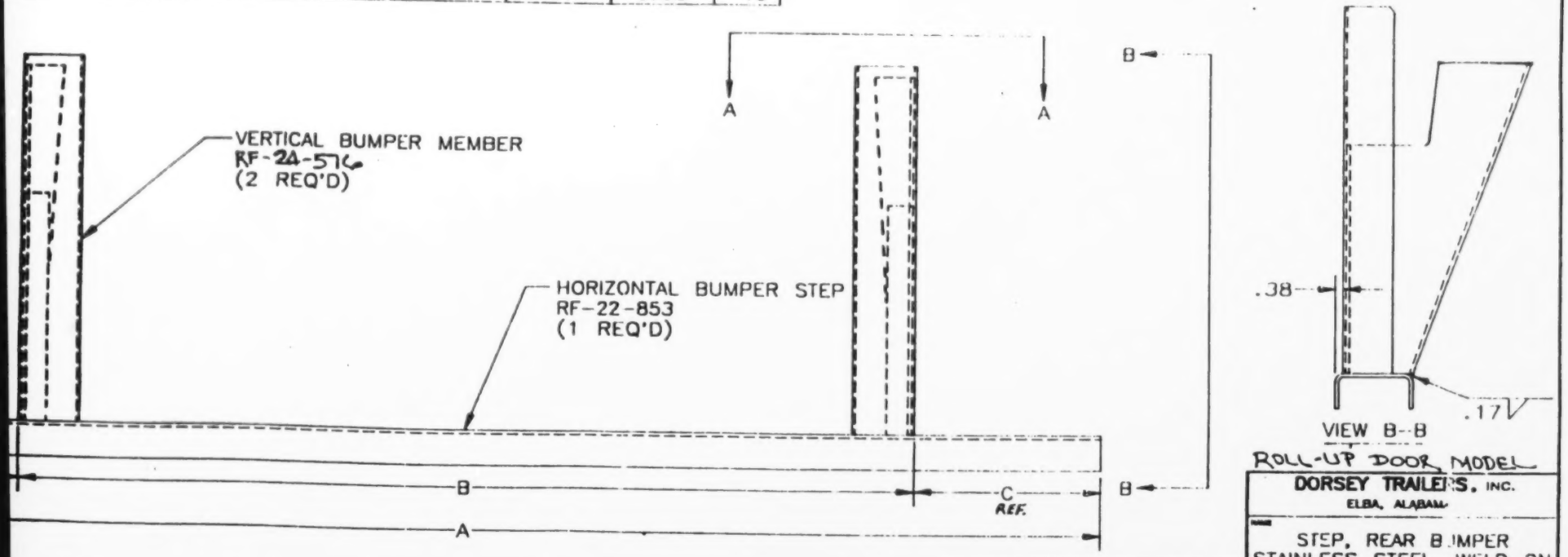
4. What is the name of the blueprint?

5. What is the scale of the blueprint?

WLDOWEJSSR

	AIR RIDE SUPER-RIDE	42.19	42.44	8.78	-05
QUICK CHANGE	FLANGE	38.00	38.25	10.88	-06
	STRADDLE SUPER-RIDE	42.00	42.25	8.88	-07
	AIR-RIDE	40.00	40.25	9.88	-08
HUTCHENS	FLANGE	44.63	44.88	10.56	-09
	STRADDLE AIR-RIDE SUPER-RIDE	48.63	48.88	8.56	-10
	AIR-RIDE 11700	46.50	46.75	9.63	-11
BINKLEY	FLANGE	44.19	44.44	10.78	-12
	STRADDLE AIR-RIDE SUPER-RIDE	48.19	48.44	8.78	-13
QUICK CHANGE	FLANGE	44.00	44.25	10.88	-14
	STRADDLE SUPER-RIDE	48.00	48.25	8.88	-15
	AIR-RIDE	46.00	46.25	9.88	-16





ROLL-UP DOOR MODEL

DORSEY TRAILERS, INC.
ELBA, ALABAMA

STEP, REAR BUMPER
STAINLESS STEEL, WELD ON

DR MORROW | SCALE .25
CH | DATE 8-30-90

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Reading
Scan Rapidly for Information
Welder

JOB SIMULATION - DORSEY

Answer Key

1. 2

2. 8-30-90

3. 2

4. Step, rear bumper stainless steel, weld on

5. .25

WLDOWEJSSR

Reading
Scan Rapidly for Information
Welder

REVIEW - DORSEY

Instructions: Please scan the appropriate documents for the following information.

Figure 2-18

1. To what group of welding does Pressure Gas Welding belong?

2. What welding process is designated by the letters WS?

3. How many welding processes are included in the Soldering group?

4. To what group of welding does Electro Gas Welding belong?

5. What is the letter designation for Gas Metal Arc Welding?

Information Sheet - Scan Section Two

6. What is the title of the chart?

7. What is the suggested amperage range for a core wire with a diameter of 1/8"?

8. What is the suggested amperage range for core wire with a diameter of 3/16"?

9. What is the standard length when using a wire with a 3/32" diameter and an amperage range of 30-80?

10. What is the approximate number of electrodes per pound for a core wire size of 1/16" and a standard length of 18"?

WLDOWERESR

FIGURE 2-18 Popular welding processes and letter designations.

	Welding Process	Letter Designation
Arc welding	Carbon arc	CAW
	Electro gas	EGW
	Flux-cored arc	FCAW
	Gas metal arc	GMAW
	Gas tungsten arc	GTAW
	Plasma arc	PAW
	Shielded metal arc	SMAW
	Stud arc	SW
	Submerged arc	SAW
Brazing	Diffusion brazing	DFB
	Dip brazing	DB
	Furnace brazing	FB
	Induction brazing	IB
	Infrared brazing	IRB
	Resistance brazing	RB
	Torch brazing	TB
Oxyfuel gas welding	Oxyacetylene welding	OAW
	Oxyhydrogen welding	OHW
	Air acetylene	
	Pressure gas welding	PGW
Resistance welding	Flash welding	FW
	Projection welding	RPW
	Resistance seam welding	RSEW
	Resistance spot welding	RSW
	Upset welding	UW
Solid-state welding	Cold welding	CW
	Diffusion welding	DFW
	Explosion welding	EXW
	Forge welding	FOW
	Friction welding	FRW
	Hot pressure welding	HPW
	Roll welding	ROW
	Ultrasonic welding	USW
Soldering	Dip soldering	DS
	Furnace soldering	FS
	Induction soldering	IS
	Infrared soldering	IRS
	Iron soldering	INS
	Resistance soldering	RS
	Torch soldering	TS
	Wave soldering	WS
Other welding processes	Electron beam	EBW
	Electroslag	ESW
	Flow	FLOW
	Induction	IW
	Laser beam	LBW
	Percussion	PEW
	Thermit	TW

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A. Selecting Electrodes

1. Kinds of Electrodes

An electrode is a metal rod which is usually covered with a coating of flux. There are two kinds of electrodes:

1. Bare or lightly coated. These electrodes are often used by beginners in welding. Bare electrodes cannot be used successfully with AC welders, but lightly coated ones can be used.

2. Shielded-Arc or heavy coated. These electrodes have a coating of flux which carries the slag from the metal to the top of the weld and keeps the air from the weld until the metal cools. The slag can then be removed. A steadier arc can be held with a shielded-arc electrode. A shielded-arc electrode produces a stronger and a neater weld than a bare or lightly coated electrode.

2. Sizes of Electrodes

Electrodes are given size designation by diameter and length. For school shop use, diameters from 1/16 inch to 3/16 inch are commonly used. The diameter is measured on the core of the electrode on the bare end or center. Length of the electrode is also used in stating size, which usually runs 18 inches, 14 inches, and 12 inches.

Electrode Specifications of E6013 Electrodes[1]

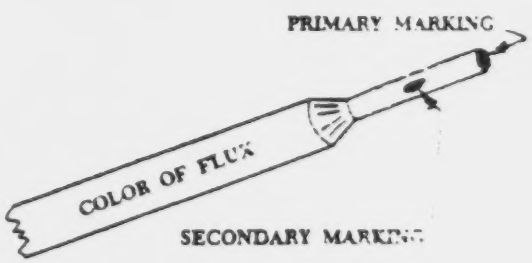
ACTUAL SIZE	STANDARD SIZE DIAMETER OF CORE WIRE	APPROXIMATE NUMBER OF ELECTRODES PER POUND	STANDARD LENGTHS	AMPERAGE RANGE
•	1/16"	53	18"*	20-40
•	3/32"	36	12"	30-50
•	1/8"	17	14"	70-120
•	5/32"	11	14"	120-170
•	3/16"	8	14"	140-240

*18" length electrodes manufactured as contact-type electrodes.

[1]Taken from *Arc Welding Lessons for School and Farm Shop*, The James F. Lincoln Arc Welding Foundation.

3. Identification of Electrodes

Identification of electrodes is by a number code and a color code. A colored mark on an end and a side of each electrode is used. For example, the color code for the mild steel electrode frequently used is brown and the number code is E6013. To avoid confusion, some manufacturers are now stamping the number code near the grip end of the electrode.



Identify the electrode by color of primary, secondary, and flux at points illustrated.

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Reading
Scan Rapidly for Information
Welding

REVIEW - DORSEY

Answer Key

1. Oxyfuel gas welding

2. Wave soldering

3. 8

4. Arc welding

5. GMAW

6. Electrode Specifications of E6013 Electrodes

7. 70-120

8. 140-240

9. 12"

10. 53

WLDOWERESR

Reading
Locating Necessary Information
Welder

PREVIEW - DORSEY

Instructions: Refer to the Combination Welder (Table of Contents) and Structural Welding Code (Table of Contents) to answer the following questions.

1. Kim's boyfriend is a combination welder and she wants to know what combination welders do. What page should she read?

2. Chuck wants to be a combination welder when he graduates from high school. He wants to know what to do to become a combination welder. What page should Chuck read?

3. Bill has forgotten what the word "slag" means. What page should Bill turn to for help?

4. Sue is interested in learning the procedure for Shielded Metal Arc Welding. To what page should Sue turn?

5. All welding equipment is to be inspected next month by an AWS Certified Welding Inspector (CWI). Where might some information about what he/she will be inspecting be found?

6. Sam is interested in the designs of different welded joints. What pages should Sam read?

7. Chuck is interested in qualifying to be a tacker. Where can Chuck find this information?

8. The welder working on the new Dorsey manufacturing building need to know the allowable stress for their welds. Where can they find this information?

9. A new bridge is to be built over the Pea River and the builders need to know the dimensional tolerances of the girders. Beginning on what page will this information be found?

10. Information regarding Submerged Arc Welding may be found on what page?

WLDOWEPRLN

CONTENTS

HAVE YOU EVER? 1

WHAT DOES A COMBINATION WELDER DO? 2

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8. Design of New Buildings 127
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9. Design of New Bridges 137
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BEST COPY AVAILABLE

Reading
Locating Necessary Information
Welder

PREVIEW - DORSEY

Answer Key

1. 2

2. 16

3. 23

4. 48

5. 99

6. 3-5

7. 97

8. 128

9. 138

10. 49

WLDOWEPRLN

Reading
Locating Necessary Information
Welder

JOB SIMULATION - DORSEY

Instructions: Listed below are some chapters from a welding manual.

I. Identifying Metals

II. Determining Amperage and Polarity Setting

III. Practicing Safety in Arc Welding

IV. Identifying Materials and Equipment Used in Arc Welding

V. Preparing Metal For Welding

VI. Striking and Establishing an Arc

Please identify which chapter the following information might be found.

1. The difference between an AC and DC welder.

2. Explaining the meaning of polarity.

3. How to strike 10 arcs without missing or sticking by the tapping method.

4. How to identify various metals through the spark test.

5. Identify safety precautions for arc welding.

WLDOWEJSLN

Reading
Locating Necessary Information
Welder

JOB SIMULATION - DORSEY

Answer Key

1. IV

2. II

3. VI

4. I

5. III

WLDOWEJSLN

Reading
Locating Necessary Information
Welder

REVIEW - DORSEY

Instructions: For each of the situations described below, please write the page number where helpful information might be obtained.

1. The blueprint Sam is using calls for a plug weld technique. He can't remember the technique.

2. Chuck wants to know the minimum fillet weld size for prequalified joints.

3. Mike is interested in how ultrasonic testing of welds is accomplished.

4. James can't remember what ESW means.

5. The supervisor wants everyone to prepare base metal the same way.

6. Sue must know the requirements for welding steel studs to steel.

7. Carol must assess if all of the welders employed are qualified.

8. The company wished to assess the quality of its welding procedures.

9. Chuck can't remember what SMAW means.

10. Pam needs to know what courses she should take in high school that will help her become a welder.

WLDOWERELN

CONTENTS

HAVE YOU EVER? 1

WHAT DOES A COMBINATION WELDER DO? 2

WHERE DOES A COMBINATION WELDER WORK? 12

WHAT TRAINING, EDUCATION, AND EXPERIENCE DO YOU NEED TO BECOME A COMBINATION WELDER? 16

DO YOU WANT TO DO MORE COMBINATION WELDER'S ENGLISH? 18

DO YOU WANT TO EXPLORE SOME MORE? 22

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1. General Provisions 1

2. Design of Welded Connections 3
   Part A. General Requirements 3
   Part B. Structural Details 3
   Part C. Details of Welded Joints 3

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   Part A. General 4
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   Part E. Electroslag and Electrogas Welding 5
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5. Qualification 5
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9. Design of New Bridges 13
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Reading
Locating Necessary Information
Welder

REVIEW - DORSEY

Answer Key

1. 55

2. 5

3. 109

4. 23

5. 33

6. 121

7. 92

8. 58

9. 23

10. 16

WLDOWERELN

Reading
Interpret Diagrams/Charts
Welder

PREVIEW - DORSEY

Instructions: Please refer to the specified document for answering the following questions.

Document -460-, -Information Sheet-, "Adjusting the Current", #3

1. For metal 1/4 inch thick, select an electrode size _____ and an amperage setting of _____.

2. To weld metal 1/2 inch think, use a _____ inch electrode and amperage setting of _____.

3. When welding metal 1/8 inch thick, select a _____ inch electrode and set the welder on _____ amps.

4. If the welder is set on 80 amperes, what size electrode would be used? _____ What thickness metal? _____

Document -461-, -Information Sheet-

Match the letters of the welding beads with the appropriate description.

5. Amperage low

6. Normal bead

7. Amperage high

Document -122-, Section 6 Welding Drawings

8. What is the title of Figure 27-2?

9. What is the symbol for a J Groove Weld?

10. What is the symbol for a Fillet Weld?

WLDOWEPRID

INFORMATION SHEET

A. Adjusting the Current:

1. A wide range of current is necessary for the various sizes and types of electrodes and for the different kinds of metals and welds used. Arc welders are constructed so that current may be adjusted. The manufacturer's instructions for using the welder suggest the correct current settings to use. These instructions should be followed. It is important to use the proper welding current in order to obtain a satisfactory weld.

2. In using a DC welder, set it to the polarity suggested by the manufacturer of the electrode being used. The machine is set on "straight polarity" when the electrode holder and cable is connected to the negative terminal on the welder, and on "reverse polarity" when the electrode holder and cable is connected to the positive terminal on the welder. An AC transformer type of AC welder does not have polarity.

3. The chart shows the approximate amperage setting for various metal thickness and electrode size. After setting the welder, if the work is too hot, reduce the amperage. If it is too cold, raise the amperage. It will be found that there is considerable allowable latitude in heat for any given-size electrode, which is governed by the thickness of metal involved, speed of travel, and the arc length.

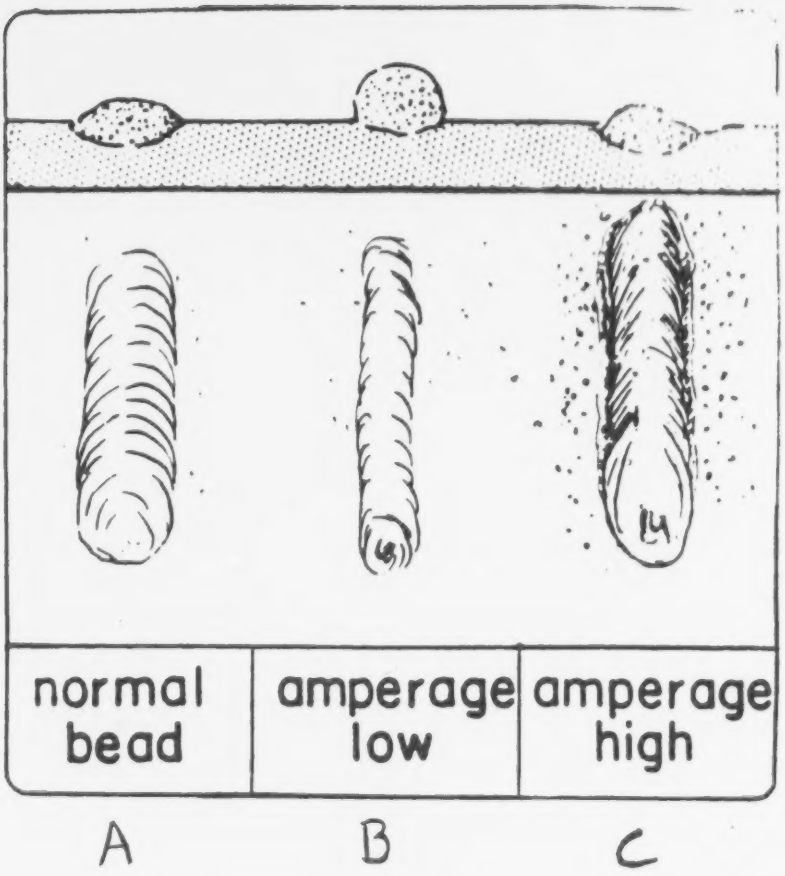
Electrode Size and Suggested Ampere Setting To Be Used When Welding in Flat Position

Metal thickness	1/16"	3/32"	1/8"	3/16"	1/4"	5/16"	3/8"	1/2"
Electrode size	3/32"	7/32"	1/8"	1/8"	5/32"	5/32"	5/32"	5/32"
*Amperage setting	65	80	100	115	130	140	160	175

*The amperage settings given are approximate. It may be necessary to select a higher or lower amperage setting, depending on the skill of the operator and welding conditions

You will know that amperage is too high and work too hot when the bead is flat and porous, with considerable spatter along the edge. The electrode (rod) will heat up. Too-low setting of amperage will cause the bead to pile up and produce excessive overlap, with poor penetration. On low amperage, the arc has a tendency to smother out. (See illustration on next page.)

INFORMATION SHEET



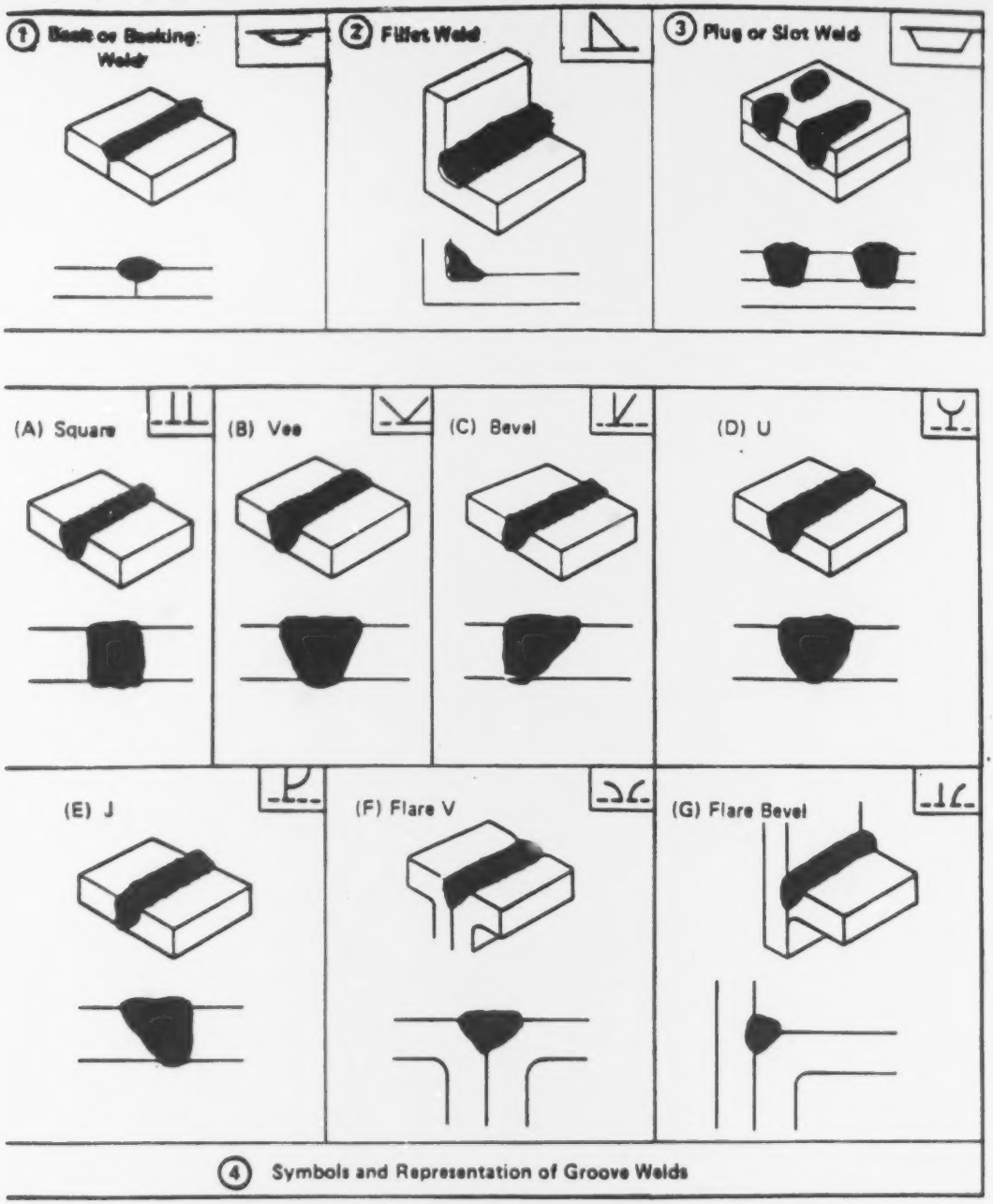


FIGURE 27-2 ANSI symbols and examples of common arc and gas welds.

RESISTANCE WELDING: TYPES AND SYMBOLS

Resistance welding is another method of fusing parts. The fusing temperature is produced in the particular area to be welded by applying force and passing electric current between two electrodes and the parts. Resistance welding does not require filler metal or fluxes. The symbols for general types of resistance welds are given in figure 27-3. These are *nonpreferred symbols.* Their replacement is recommended by using preferred symbols and including the process reference in the tail.

Reading
Interpret Diagrams/Charts
Welder

PREVIEW - DORSEY

Answer Key

1. 5/32", 130

2. 5/32", 175

3. 1/8", 100

4. 3/32", 3/32"

5. B

6. A

7. C

8. ANSI symbols and examples of common arc and gas welds

9.

10.

WLDOWEPRID

Reading
Interpret Diagrams/Charts
Welder

JOB SIMULATION - DORSEY

Instructions: Please refer to the attached document to answer the following questions.

1. See section B-B. What type of welds are indicated?

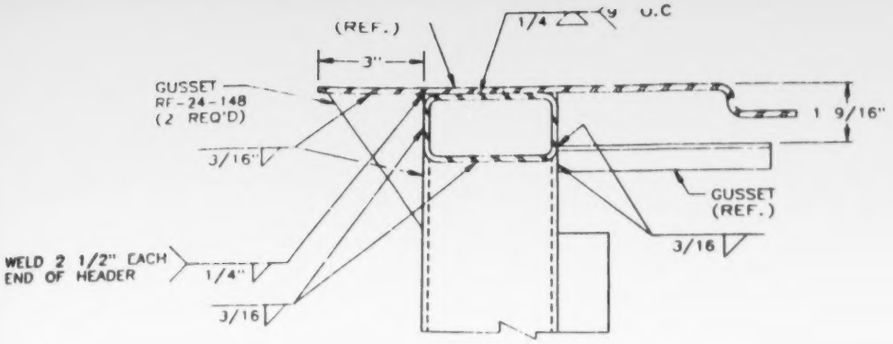
2. See section B-B. What size welds are indicated for the reinforcement bar?

3. Where do you get information for bumper step installment (weld on)?

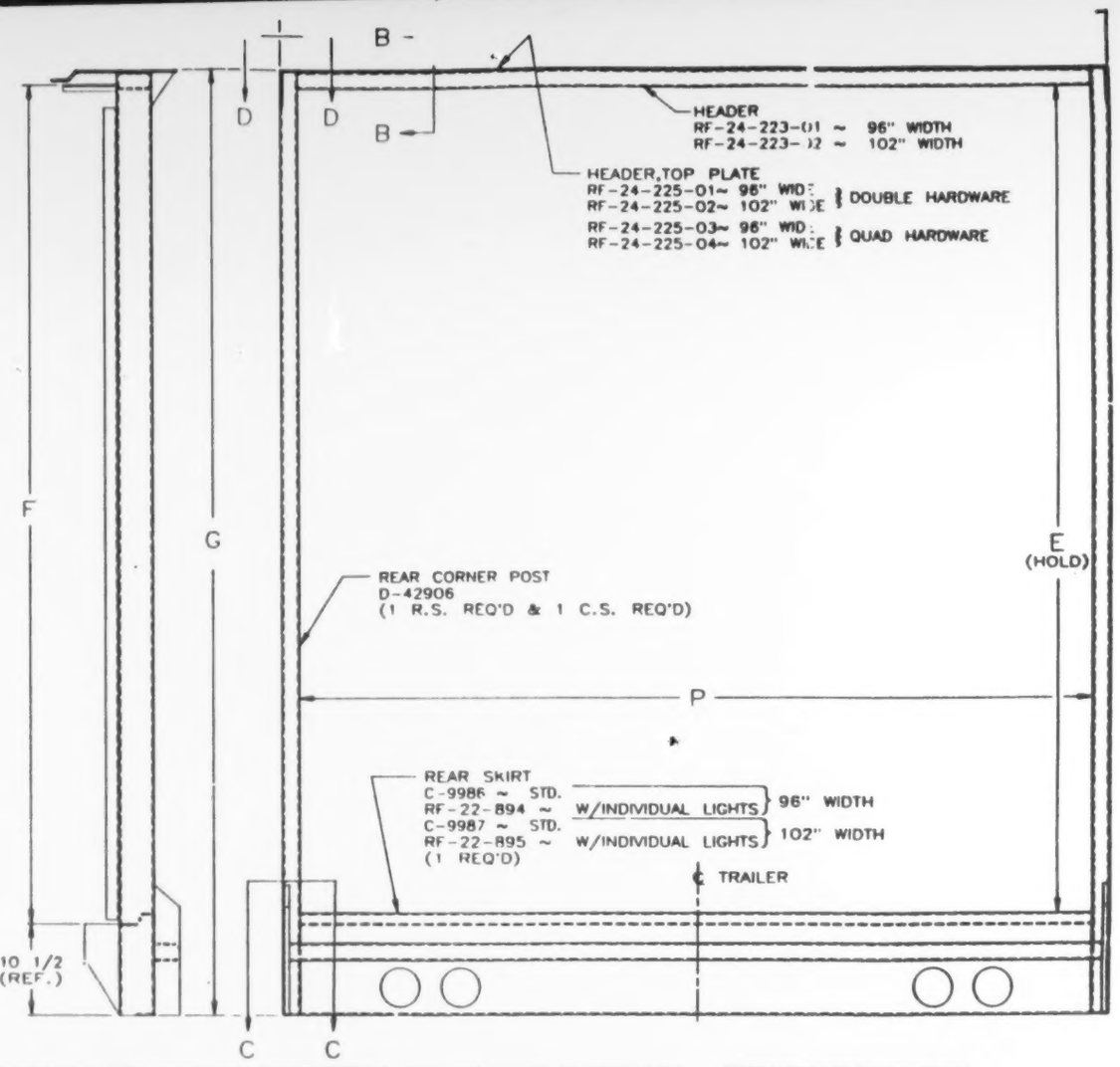
4. What are the instructions for welding the ends of the header?

5. What type hardware is to be used on the header, top plate when using RF-24-225-02-102" wide?

WLDOWEJSID



SECTION B-B
SCALE: 1/2" = 1"



NOTES:

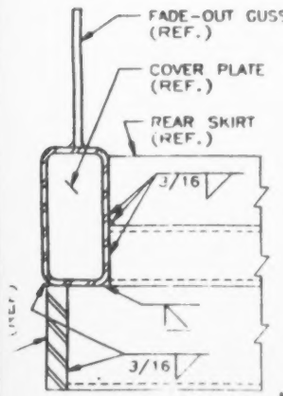
1-SEE DWG. NO. D-42015 FOR UPPER REAR CORNER DETAILS.

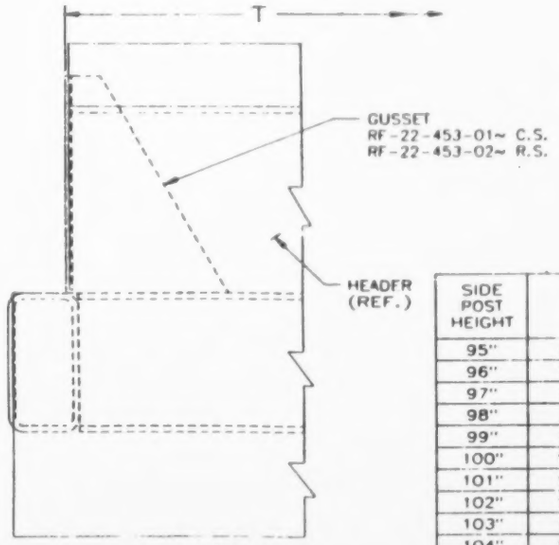
2-SEE DWG. NO. D-41389 FOR LOWER REAR CORNER DETAILS.

3-SEE DWG. NO. D-41858 FOR BUMPER STEP INSTALLATION (WELD ON) USE STAINLESS STEEL VERSION.

4-SEE DWG. NO. D-41856 FOR BUMPER STEP INSTALLATION (BOLT ON) USE STAINLESS STEEL VERSION.

5-SEE DWG. NO. D-40174 FOR LIGHT COVER INSTALLATION.





SIDE POST HEIGHT	E	F	G
95"	95"	96 7/8"	108 15/16"
96"	96"	97 7/8"	109 15/16"
97"	97"	98 7/8"	110 15/16"
98"	98"	99 7/8"	111 15/16"
99"	99"	100 7/8"	112 15/16"
100"	100"	101 7/8"	113 15/16"
101"	101"	102 7/8"	114 15/16"
102"	102"	103 7/8"	115 15/16"
103"	103"	104 7/8"	116 15/16"
104"	104"	105 7/8"	117 15/16"
105"	105"	106 7/8"	118 15/16"

SIDE POST HEIGTH	E	F	G
107 3/8"	107 3/8"	109 1/4"	121 5/16"
108"	108"	109 7/8"	121 15/16"
108 3/8"	108 3/8"	110 1/4"	122 5/16"
109"	109"	110 7/8"	122 15/16"
109 3/8"	109 3/8"	111 1/4"	123 5/16"
110"	110"	111 7/8"	123 15/16"
110 3/8"	110 3/8"	112 1/4"	124 5/16"
111"	111"	112 7/8"	124 15/16"
111 3/8"	111 3/8"	113 1/4"	125 5/16"
112"	112"	113 7/8"	125 15/16"
112 3/8"	112 3/8"	114 1/4"	126 5/16"

TRAILER WIDTH	N	P	T
96"	96"	92"	92 11/16"
102"	102"	98"	98 11/16"

78

2 3/16" FLAT HEADER

DORSEY TRAILERS, INC.
ELBA, ALABAMA

REAR FRAME ASS'Y
FOR "87" VANS
(STAINLESS STEEL)

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Reading
Interpret Diagrams/Charts
Welder

JOB SIMULATION - DORSEY

Answer Key

1. Fillet weld

2. 3/16

3. DWG. No. D-41858

4. Weld 2 1/2" each end

5. Double hardware

WLDOWEJSID

Reading
Interpret Diagrams/Charts
Welder

REVIEW - DORSEY

Instructions: Please refer to the specified document for answering the following questions.

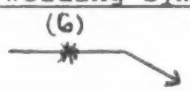
Document -122-, Section 6 Welding Drawings

1. What does _ _ represent?

2. What is the symbol for a backing weld?

3. What does represent?

Document - ANSI welding symbols, functions and drawing representation

4. What does  represent?

5. How would you represent a fillet weld on both sides?

6. What is the symbol for a root opening?

7. What are the three types of weld contours?

8. What does represent?

9. What does represent?

10. What does represent?

WLDOWEREID

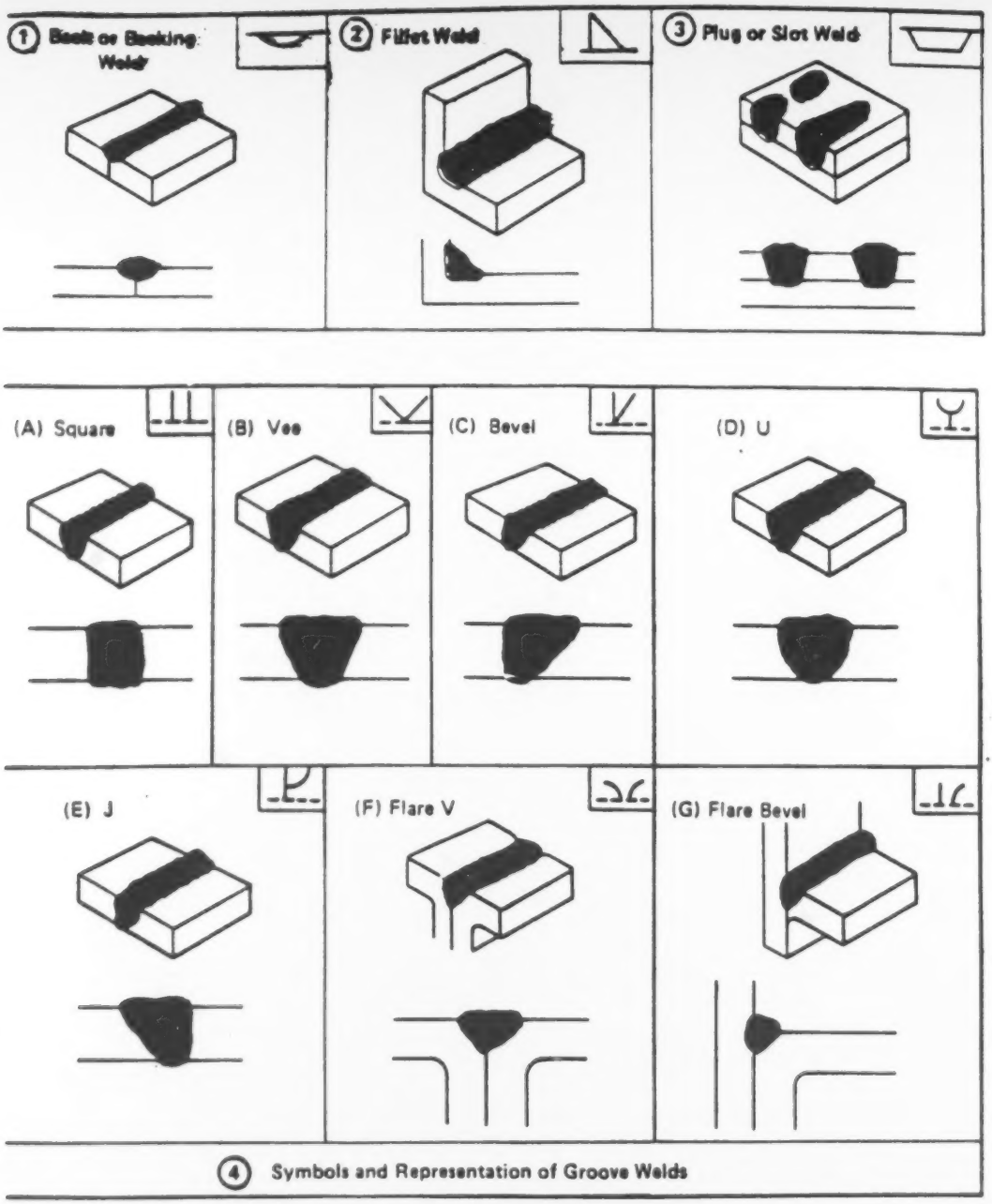
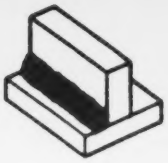
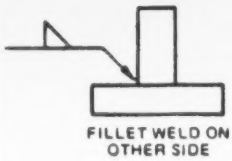
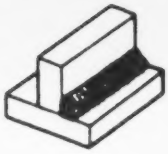
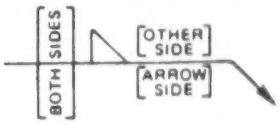
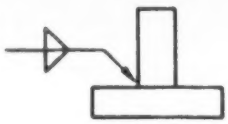
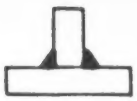
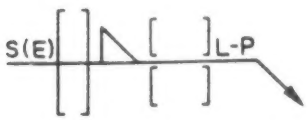
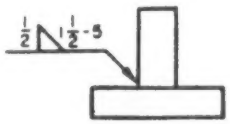
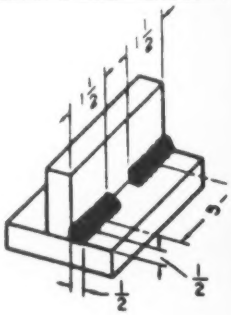
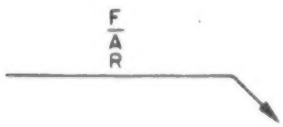
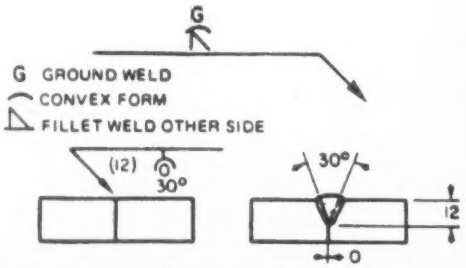
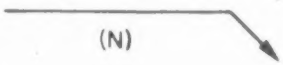
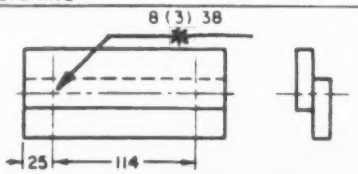
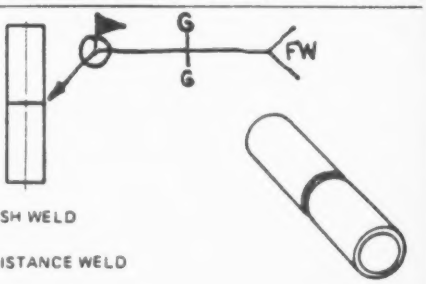


FIGURE 27-2 ANSI symbols and examples of common arc and gas welds.

RESISTANCE WELDING: TYPES AND SYMBOLS

Resistance welding is another method of fusing parts. The fusing temperature is produced in the particular area to be welded by applying force and passing electric current between two electrodes and the parts. Resistance welding does not require filler metal or fluxes. The symbols for general types of resistance welds are given in figure 27-3. These are *nonpreferred symbols.* Their replacement is recommended by using preferred symbols and including the process reference in the tail.

(1) Reference line	Basis of welding symbol and all elements. Contains weld data about size, type, position, length, pitch, and strength.	FILLET WELD ON ARROW SIDE 
(2) Arrowhead	Connects the reference line to the arrow side member of the joint or grooved member, or both. Points to the joint where the weld is to be placed.	 FILLET WELD ON OTHER SIDE 
(3) Basic weld symbol and weld side 	Attached to reference line to show the kind of weld and the sides to be welded, or provides detailed reference.	 FILLET WELD ON BOTH SIDES 
(4) Dimensions of weld 	S denotes size or strength of certain welds; E effective throat or depth of penetration; L length; P pitch (center-to-center spacing of welds), where applicable. Weld types and dimensions are placed on OTHER SIDE, ARROW SIDE, or BOTH SIDES.	  1/2" LEG FILLET WELD, 1 1/2" LONG, 5" CENTER-TO-CENTER SPACING, BOTH SIDES
(5) Finish, contour, and groove angle 	F specifies the finish of the weld: chip (C), machine (M), and grind (G). — shows the contour of the weld: flush —, convex ⌒, and concave ⌣. A indicates the groove angle, included angle of countersink for plug welds.	 U GROOVE, ARROW SIDE 12 mm DEEP, 30° ANGLE, 0 mm ROOT OPENING
(6) Root opening R	R specifies the depth of filling for plug or slot welds.	
(7) Number of spot welds 	Number in parentheses gives the number of spot or projection welds.	 SPOT WELD, 8 mm DIAMETER (3) WELDS, 38 mm BETWEEN WE
(8) Field weld and all around weld symbols	indicates parts are to be welded final assembly or in the field. signifies weld extends around part.	
(9) Tail	T provides additional welding process information or specifications which are not otherwise shown by symbols.	FW FLASH WELD RESISTANCE WELD WELDED AROUND THE PART IN THE FIELD G FLAT GROUND FINISHED SURFACE

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ANSI welding symbols, functions, and drawing representation

Reading
Interpret Diagrams/Charts
Welder

REVIEW - DORSEY

Answer Key

1. U Groove Weld

2.

3. Plug or Slot Weld

4. Six spot welds

5.

6. R

7. Flush, convex, or concave

8. Ground weld, concave form, fillet weld other side

9. 3/16 leg fillet weld, 1 1/4" long, 6" center-to-center spacing, both sides

10. Use a flash weld

WLDOWEREID

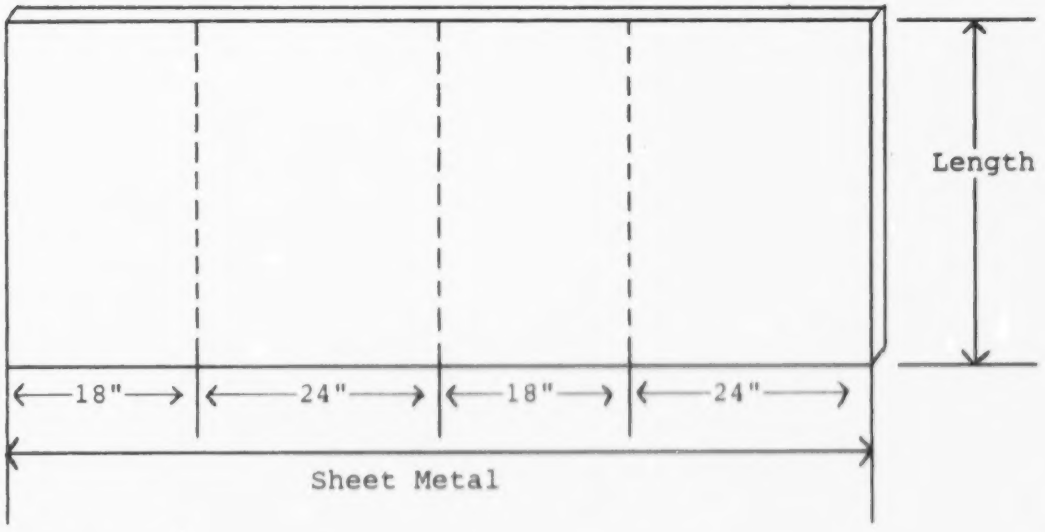
Math
Whole Numbers
Welder

PREVIEW - DORSEY

Instructions: Please compute and answer the following questions.

1. An inventory of the steel rack of a welding shop shows: angle, 84 feet; channel, 183 ft; I beam, 74 feet; 1-inch square tubing, 1,117 feet. **Add** to find, in feet, the total amount of steel in the inventory.

2. Layout work for a welded rectangular steel pipe is shown. **Add** to find the total number of inches in steel in the width of the layout.



WLDOWEPRWN

3. A welder is required to flame cut 48" from a 91" piece of angle iron. **Subtract** to find out how much angle iron remains of the original piece after the cut is made?

4. A length of pipe is 34" inches long. Two cut pieces, each measuring 14" are removed. **Subtract** to find out how long the remaining length of pipe is.

5. A welding job requires 668 pieces of bar stock, each 7" inches long. **Multiply** to find the total length of bar stock, in inches, required for this job.

6. What is the total height of a stack of 16 washers if each washer is 4" wide. **Multiply** to find your answer.

7. A welded tank support requires 12 pieces of wide-flange beam to be cut. Each piece of beam is 38 inches long. **Multiply** to find the total number of inches of beam used.

8. New steel is delivered in 28 foot lengths. A section must be sheared into 4 foot long pieces. **Divide** to find out how many pieces can be obtained from each length.

9. How many shear pins each 4 centimeters long, can be cut from a round bar that is 200 centimeters long. **Divide** to find your answer.

10. Twelve water tanks were constructed in the welding shop. The tanks hold a total of 9,600 gallons. **Divide** to find out how many gallons each tank will hold.

WLDOWEPRWN

Math
Whole Numbers
Welder

PREVIEW - DORSEY

Answer Key

1. 1,458 feet

2. 84"

3. 43"

4. 6"

5. 4,676"

6. 64"

7. 456"

8. 7

9. 50

10. 800 gallons

WLDOWEPRWN

Math
Whole Numbers
Welder

JOB SIMULATION - DORSEY

Instructions: Please compute the following problems. Refer to Drawing Number D-42905 if necessary.

1. Al is working with two different side posts. One is 112" tall and the other is 96" tall. **Add** to find out the combined height of both side posts.

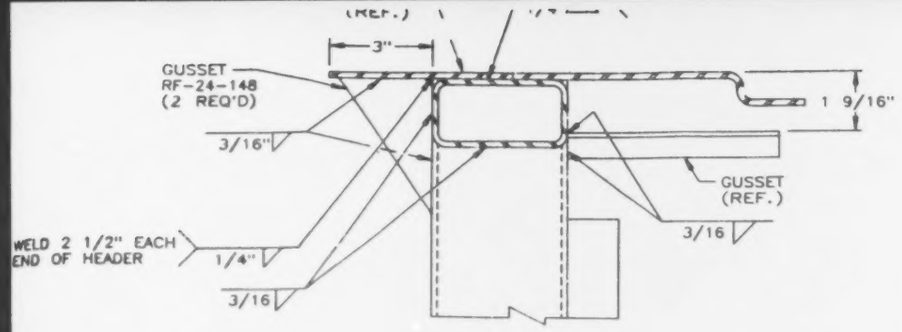
2. Al is working with the same two side posts. (112" tall and 96" tall). **Subtract** to find out the difference, in inches, of the two side posts.

3. Sam worked six hours a day for twelve days on assembling the rear frame for '92 vans. **Multiply** to find the total amount of hours Sam worked.

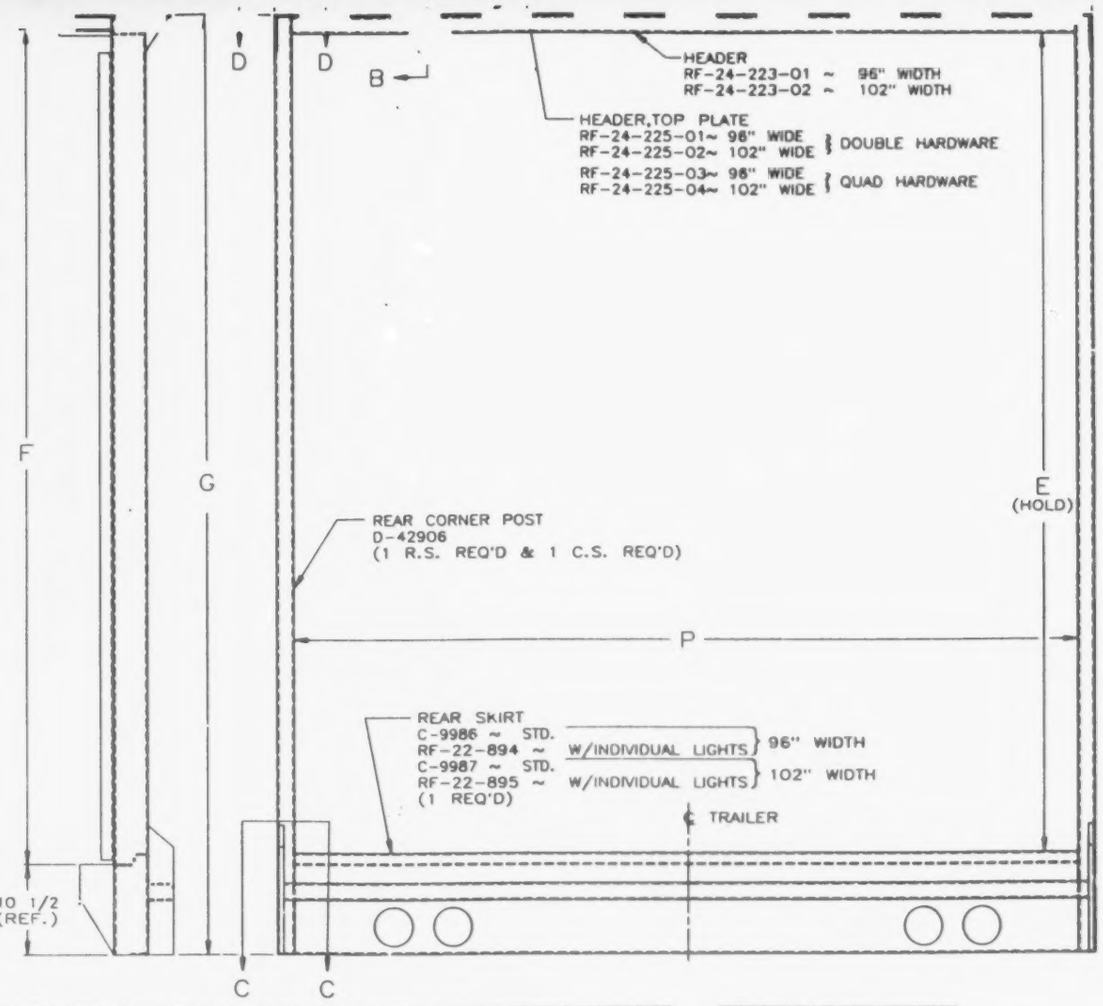
4. The side post inventory contained 2 of the 108" tall side posts. **Multiply** to find the height, in inches, of the side posts if they were stacked vertically.

5. Imagine a vertical stack of side posts that is 480" tall. **Divide** to find out how many 96" side posts are in the stack.

WLDOWEJSWN



SECTION B-B
SCALE:1/2"=1"



NOTES:

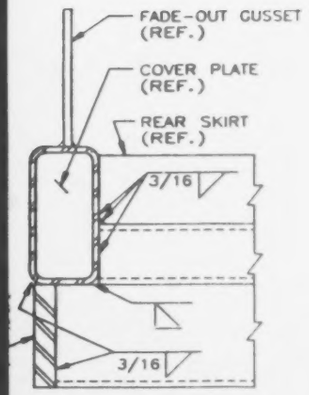
1-SEE DWG. NO. D-42015 FOR UPPER REAR CORNER DETAILS.

2-SEE DWG. NO. D-41389 FOR LOWER REAR CORNER DETAILS.

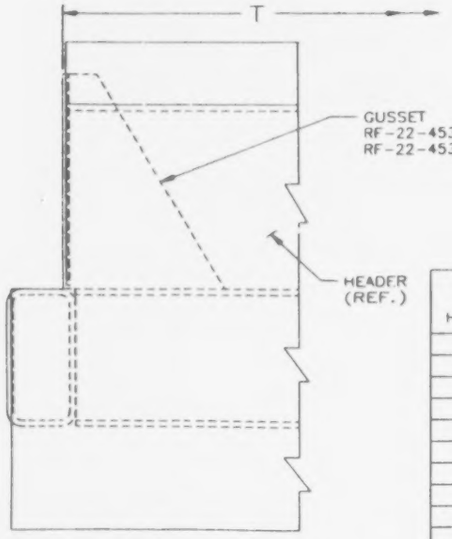
3-SEE DWG. NO. D-41858 FOR BUMPER STEP INSTALLATION (WELD ON) USE STAINLESS STEEL VERSION.

4-SEE DWG. NO. D-41856 FOR BUMPER STEP INSTALLATION (BOLT ON) USE STAINLESS STEEL VERSION.

5-SEE DWG. NO. D-40174 FOR LIGHT COVER INSTALLATION.



SECTION B-B



VIEW D-D

SIDE POST HEIGHT	E	F	G
95"	95"	96 7/8"	108 15/16"
96"	96"	97 7/8"	109 15/16"
97"	97"	98 7/8"	110 15/16"
98"	98"	99 7/8"	111 15/16"
99"	99"	100 7/8"	112 15/16"
100"	100"	101 7/8"	113 15/16"
101"	101"	102 7/8"	114 15/16"
102"	102"	103 7/8"	115 15/16"
103"	103"	104 7/8"	116 15/16"
104"	104"	105 7/8"	117 15/16"
105"	105"	106 7/8"	118 15/16"
106"	106"	107 7/8"	119 15/16"
107 3/8"	107 3/8"	109 1/4"	120 5/16"

SIDE POST HEIGTH	E	F	G
107 3/8"	107 3/8"	109 1/4"	121 5/16"
108"	108"	109 7/8"	121 15/16"
108 3/8"	108 3/8"	110 1/4"	122 5/16"
109"	109"	110 7/8"	122 15/16"
109 3/8"	109 3/8"	111 1/4"	123 5/16"
110"	110"	111 7/8"	123 15/16"
110 3/8"	110 3/8"	112 1/4"	124 5/16"
111"	111"	112 7/8"	124 15/16"
111 3/8"	111 3/8"	113 1/4"	125 5/16"
112"	112"	113 7/8"	125 15/16"
112 3/8"	112 3/8"	114 1/4"	126 5/16"

TRAILER WIDTH	N	P	T
96"	96"	92"	92 11/16"
102"	102"	98"	98 11/16"

BEST COPY AVAILABLE

2 3/16" FLAT HEADER

DORSEY TRAILERS, INC.
ELBA, ALABAMA

REAR FRAME ASS'Y
FOR "87" VANS
(STAINLESS STEEL)

S.W. — 1/8"=1"

7-27-88

205 E

Math
Whole Numbers
Welder

JOB SIMULATION - DORSEY

Answer Key

1. 208"

2. 16"

3. 72 hours

4. 216"

5. 5

WLDOWEJSWN

Math
Whole Numbers
Welder

REVIEW - DORSEY

Instructions: Please answer the following questions.

1. You are given two pieces of steel channel. One piece is 21" long and the other is 19" long. **Add** to find the total length of the two pieces of steel channel.

2. A welded steel framework consists of plate steel, 998 pounds; bolt stock, 95 pounds; key stock, 11 pounds; channel 10, 107 pounds. **Add** to find the total number of pounds of steel in the framework.

3. A 40 centimeter long steel angle is cut from a steel angle that is 420 centimeters long. **Subtract** to find out what length of steel angle remains.

4. A stock room has 17,976 pounds of plate steel. A steel storage tank is welded from 1,288 pounds of plate. **Subtract** to find out how many pounds of plate remains in stock.

5. Twenty-seven pieces of wide-flange beam are needed for a bridge structure. Each piece is 19 feet long. **Multiply** to find the total length of the twenty-seven pieces.

6. **Multiply** to find the total length of square tubing if you have 18 pieces, each measuring 162 millimeters long.

7. **Multiply** to find out how much 14 centimeter flat stock is needed to make 49 brackets.

8. Fourteen water tanks have a total weight of 5,320 pounds. **Divide** to find the weight of each tank.

9. The total contract price for the fourteen tanks is $14,322. **Divide** to find the cost of each tank.

10. New steel is delivered in 32 foot lengths. A section must be sheared into 4 foot long pieces. **Divide** to find out how many pieces can be obtained from each length.

WLDOWEREWN

Math
Whole Numbers
Welder

REVIEW - DORSEY

Answer Key

1. 40"

2. 11,211 pounds

3. 380 cm

4. 16,688 pounds

5. 513 feet

6. 2,916 mm

7. 686 centimeters

8. 380 pounds

9. $1,023

10. 8 pieces

WLDOWEREWN

Math
Fractions
Welder

PREVIEW - DORSEY

Instructions: Please solve the following problems.

1. A piece of steel angle is cut into 14 equal parts. Express (write) 8 parts as a fractional part of the whole.

2. A piece of steel bar is cut into 6 equal parts. Express (write) 3 parts as a fractional part of the whole.

3. You have three pieces of steel angle measuring 2 1/4" long, 1 1/8" long, and 2 3/16" long. **Add** to find the total length of the three pieces of steel angle.

4. What is the total thickness of five pieces of bar steel that are 1/2" thick, 5/16" thick, 1/4" thick, 5/8" thick and 7/16" thick. **Add** to find your answer.

5. A 3 1/16" long piece of steel angle is cut from a piece measuring 6 5/8". **Subtract** to find out how much is left of the original piece.

6. A 9 5/16" long piece of bar stock is cut from a piece measuring 16 1/2" long. **Subtract** to find out how much is left of the original piece.

7. A welder has an order for 9 pieces of steel angle, each 9 3/8 inches long. **Multiply** to find the total length, in inches, steel angle required.

8. Thirteen pieces of steel angle, each 6 7/8 inches long, are welded to a piece of flat bar for use as concrete reinforcement. **Multiply** to find the total length, in inches, of steel angle required.

WLDOWEPRFR

9. A piece of metal is 23 3/4" long. **Divide** to find out how many 9/16" you can cut from this piece of metal.

10. **Divide** to find out how may 1 1/4" pieces can be cut from a piece of metal that is 35 5/8" long.

Math
Fractions
Welder

PREVIEW - DORSEY

Answer Key

1. 8/14 = 4/7

2. 3/6 = 1/2

3. 5 9/16

4. 34/16 = 2 2/16 = 2 1/8

5. 3 9/16

6. 7 3/16

7. 320/8 = 84 3/8"

8. 89 3/8"

9. 42 2/9 or 42

10. 28 1/2 or 28

WLDOWEPRFR

Math
Fractions
Welder

JOB SIMULATION - DORSEY

Instructions: Please solve the following problems. Refer to the circled numbers on the attached blueprint.

1. **Add** to find the total distance, in inches, from (1) to (2).

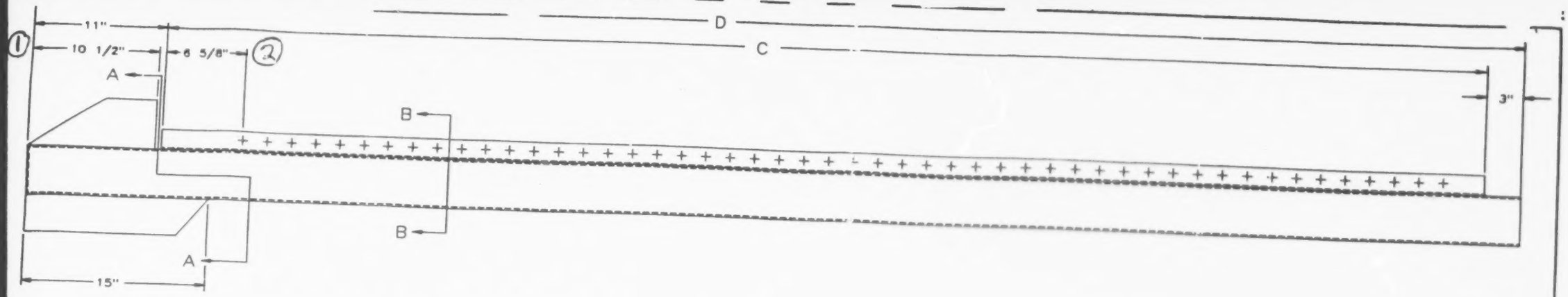
2. **Subtract** to find figure (3).

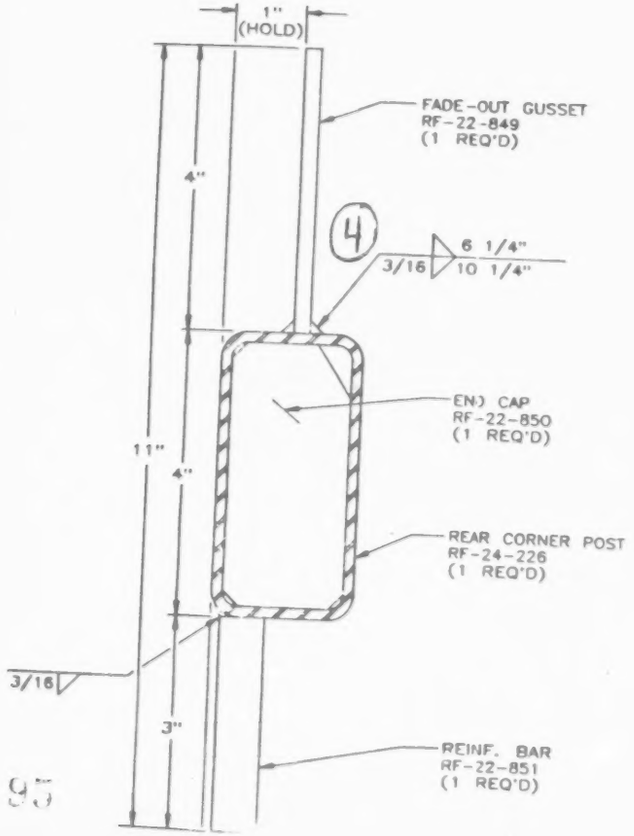
3. **Divide** to find how many 3/8" sections 5 5/8 can be split into.

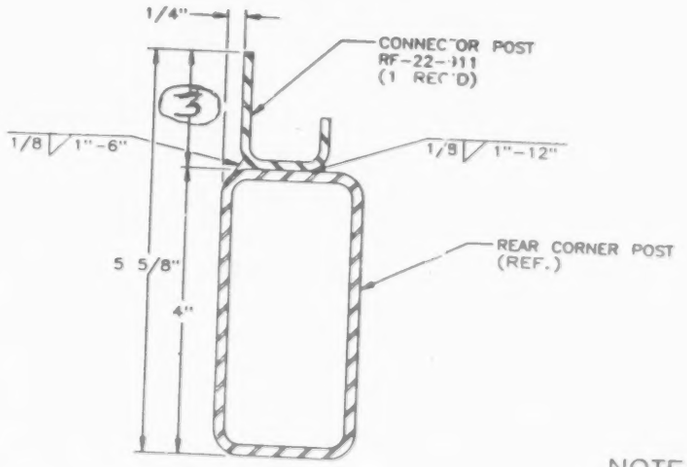
4. **Add** all of the figures next to (4).

5. Refer to (5). **Subtract** to find the difference between Side Post Height 95" and C-94 3/4".

WLDOWEJSFR







SECTION B-B
SCALE ~ FULL

SIDE POST HEIGHT	C	D
95"	9[illegible] 3/4"	108 3/4"
96"	9[illegible] 3/4"	109 3/4"
97"	9[illegible] 3/4"	110 3/4"
98"	9[illegible] 3/4"	111 3/4"
99"	9[illegible] 3/4"	112 3/4"
100"	9[illegible] 3/4"	113 3/4"
101"	10[illegible] 3/4"	114 3/4"
102"	10[illegible] 3/4"	115 3/4"
103"	10[illegible] 3/4"	116 3/4"
104"	10[illegible] 3/4"	117 3/4"
105"	10[illegible] 3/4"	118 3/4"
106"	10[illegible] 3/4"	119 3/4"
106 3/8"	10[illegible] 1/8"	120 1/8"
107"	10[illegible] 3/4"	120 3/4"
107 3/8"	107 1/8"	121 1/8"
108"	107 3/4"	121 3/4"
108 3/8"	108 1/8"	122 1/8"
109"	108 3/4"	122 3/4"
109 3/8"	109 1/8"	123 1/8"
110"	109 3/4"	123 3/4"
110 3/8"	110 1/8"	124 1/8"
111"	110 3/4"	124 3/4"
111 3/8"	111 1/8"	125 1/8"
112"	111 3/4"	125 3/4"
112 3/8"	112 1/8"	126 1/8"

NOTE:
1-ROADSIDE SHOWN, CURBSIDE OPPOSITE.

95

90

BEST COPY AVAILABLE

2 3/16" FLAT HEADER
DORSEY TRAIL FIRE

Math
Fractions
Welder

JOB SIMULATION - DORSEY

Answer Key

1. 17 1/8"

2. 1 5/8"

3. 15

4. 16 11/16"

5. 1/4"

WLDOWEJSFR

Math
Fractions
Welder

REVIEW - DORSEY

Instructions: Please solve the following problems.

1. A piece of steel bar is cut into 10 equal parts. Express (write) 7 parts as a fractional part of the whole.

2. A piece of steel angle is cut in 12 equal parts. Express (write) 8 parts as a fractional part of the whole.

3. You have two pieces of steel angle. One is 9' 3 1/2" long and the other is 2' 3 1/2" long. **Add** to find the total length of steel angle.

4. Two circular steel plates measure 3 1/8" across and 4 13/16" across. **Add** to find their combined distance.

5. A length of tubing is 18 3/16 inches long. You saw off 9 7/8 inches. **Subtract** to find out how much square tubing you have left.

6. A 5 1/4 inch long piece is cut from a piece of steel angle that measures 7 1/8 inches long. **Subtract** to find out how much steel angle you will have left.

7. A welder has an order for 12 pieces of steel angle that measures 7 3/8" long. **Multiply** to find the total length, in inches, steel angle required.

8. The same welder has an order for 14 pieces of I beam that each measure 14 3/16" long. **Multiply** to find the total length, in inches, of I beam required.

9. A piece of metal is 18 1/2" long. **Divide** to find out how many 3/4" pieces you can cut from the piece of metal.

10. **Divide** to find how many 5/16" pieces you can cut from a piece of metal 12 1/2" long.

WLDOWEREFR

Math
Fractions
Welder

REVIEW - DORSEY

Answer Key

1. 7/10

2. 8/12 = 2/3

3. 11' 7"

4. 7 15/16"

5. 8 5/16"

6. 1 7/8"

7. 88 1/2"

8. 198 5/8"

9. 24 2/3" or 24

10. 40

WLDOWEREFR

Math
Decimals
Welder

PREVIEW - DORSEY

Instructions: Please solve the following problems.

1. A piece of steel is 4 1/2 inches long. Convert this number to a decimal fraction.

2. A length of channel is 9 3/8 inches long. Convert this number of a decimal fraction.

3. A welded tank holds 26.047 gallons. Round this weight to the hundredths place.

4. The suggested electrode size is 1/8 of an inch. Convert this fraction to a decimal.

5. A leg fillet weld is to be 5/8 of an inch long. Convert this fraction to a decimal.

6. Add to find the total weight of three pieces of steel weighing 10.1962, 17.0967 pounds and 1.3542 pounds. Round your answer to the hundredths place.

7. A welder was given a bar the measured 12.6982". he sawed 6.8798" off it. **Subtract** to find how much of the bar was left. Round your answer to the thousandth inch.

8. Nine steel plates, each measuring 2.69875 cm thick, are stacked. **Multiply** to find how high the stack is.

9. **Multiply** 12 and .6080 m to find the total length of material used for 12 cross braces that measure .6080 m in length.

10. **Divide** 9.875 by 6.250.

WLDOWEPRDE

PREVIEW - DORSEY

Answer Key

1. 4.5
2. 9.375
3. 26.05
4. .125
5. .625
6. 28.647
7. 5.818 inches
8. 24.48875 cm
9. 7.296 m
10. 1.58

Math
Decimals
Welder

JOB SIMULATION - DORSEY

Instructions: Please refer to the circled numbers on Dorsey Trailers, Inc. Drawing No. D-42906 to answer the following questions.

1. Refer to the figure in (1). Express this figure as a decimal fraction.

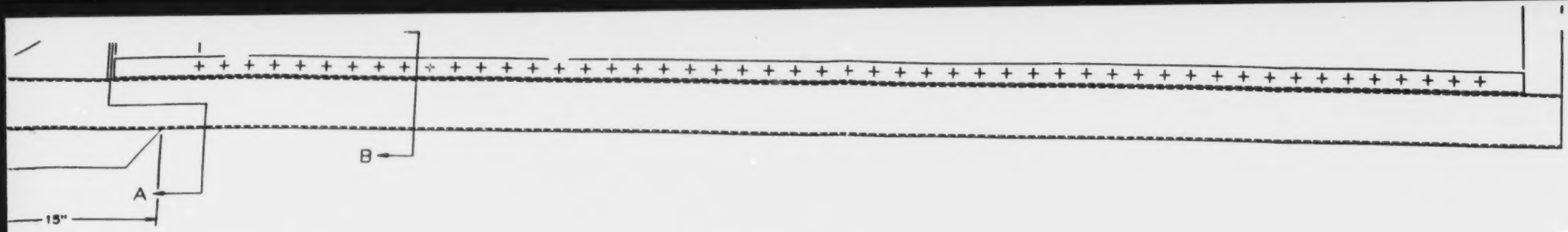
2. Refer to the figure in (2). Express this figure as a decimal fraction.

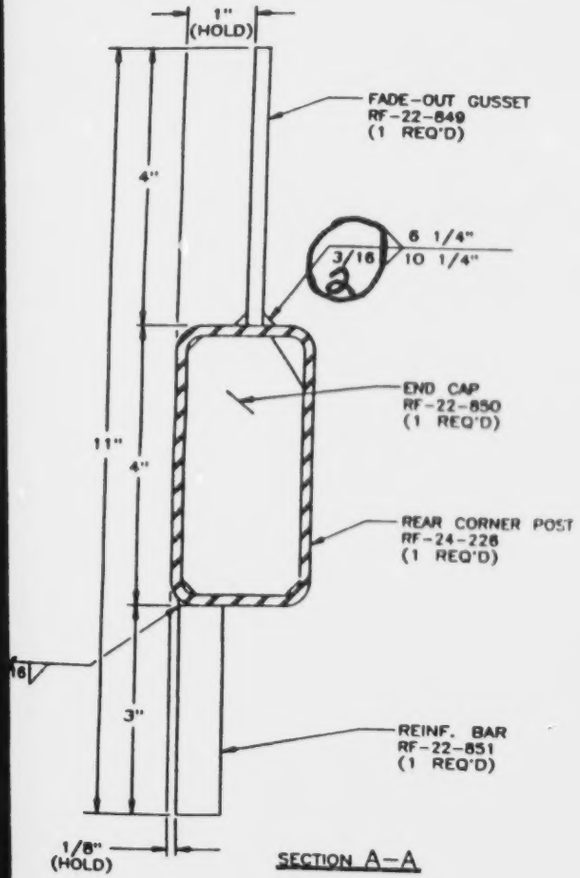
3. Express the figures in (3) and (4) as decimal fractions and then add them together.

4. Express the figures in (5) and (3) as decimal fractions and subtract figure (3) from figure (5).

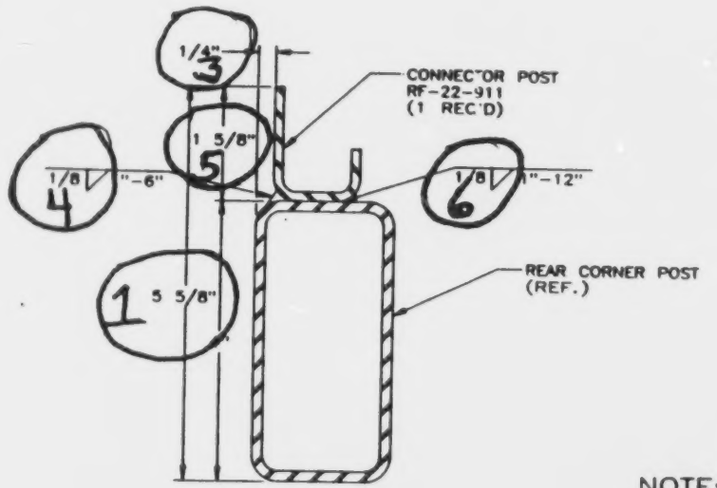
5. Express figure (6) as a decimal fraction and then multiply it by 12.

WLDOWEJSDE





SECTION A-A
SCALE ~ FULL



SECTION B-B
SCALE ~ FULL

SIDE POST HEIGHT	C	D
95"	94 3/4"	108 3/4"
96"	95 3/4"	109 3/4"
97"	96 3/4"	110 3/4"
98"	97 3/4"	111 3/4"
99"	98 3/4"	112 3/4"
100"	99 3/4"	113 3/4"
101"	100 3/4"	114 3/4"
102"	101 3/4"	115 3/4"
103"	102 3/4"	116 3/4"
104"	103 3/4"	117 3/4"
105"	104 3/4"	118 3/4"
106"	105 3/4"	119 3/4"
106 3/8"	106 1/8"	120 1/8"
107"	106 3/4"	120 3/4"
107 3/8"	107 1/8"	121 1/8"
108"	107 3/4"	121 3/4"
108 3/8"	108 1/8"	122 1/8"
109"	108 3/4"	122 3/4"
109 3/8"	109 1/8"	123 1/8"
110"	109 3/4"	123 3/4"
110 3/8"	110 1/8"	124 1/8"
111"	110 3/4"	124 3/4"
111 3/8"	111 1/8"	125 1/8"
112"	111 3/4"	125 3/4"
112 3/8"	112 1/8"	126 1/8"

NOTE:
1-ROADSIDE SHOWN, CURBSIDE OPPOSITE.

2-3/16" FLAT HEADER
DORSEY TRAILERS, INC.
ELBA, ALABAMA
STAINLESS STEEL REAR CORNER POST ASS'Y FOR "87" VANS
S.W. | 1/4"=1"
7-26-88
203 E
D-42906

BEST COPY AVAILABLE

Math
Decimals
Welder

JOB SIMULATION - DORSEY

Answer Key

1. 5.625

2. .1875

3. .25 + .125 = .375

4. 1.625 - .25 = 1.375

5. 1.5

WLDOWEJSDE

Math
Percents
Welder

PREVIEW - DORSEY

Instructions: Please solve the following problems.

1. What percent of a number is all of it?

2. Express 1/2 as a percent.

3. Express 1/4 as a percent.

4. Express 5% as a decimal.

5. Express 60% as a decimal.

6. A welder works 40 hours and earns $10.00 per hour. If he pays 12% of this in income tax, what is the dollar amount of his taxes?

7. If the same welder pays 5% of his pay in union dues, what is the dollar amount of his union dues?

8. The area of a piece of steel is 1440 square centimeters. How many square centimeters are contained in 20% of the steel?

9. A welder completes 85% of 200 welds. How many completed welds are made?

10. A total of 110,000 welds are made in a welding shop. If 3% are of poor quality, what is the number of welds that are of poor quality?

WLDOWEPRPE

Math
Percents
Welder

PREVIEW - DORSEY

Answer Key

1. 100%

2. 50%

3. 25%

4. .05

5. .60

6. 40 x $10.00 = $400.00
   12% of $400.00 = .12 x 400 = 48.00

7. 5% of $400.00 = .05 x 400 = $20.00

8. 1440 x .20 = 288 square centimeters

9. .85 x 200 = 170 completed welds

10. 110,000 x .03 = 3300 welds

WLDOWEPRPE

Math
Percents
Welder

JOB SIMULATION - DORSEY

Instructions: Please solve the following problems. Refer to the circled numbers on Dorsey Drawing No. B-44238.

1. Refer to ① . Express this figure as a percent.

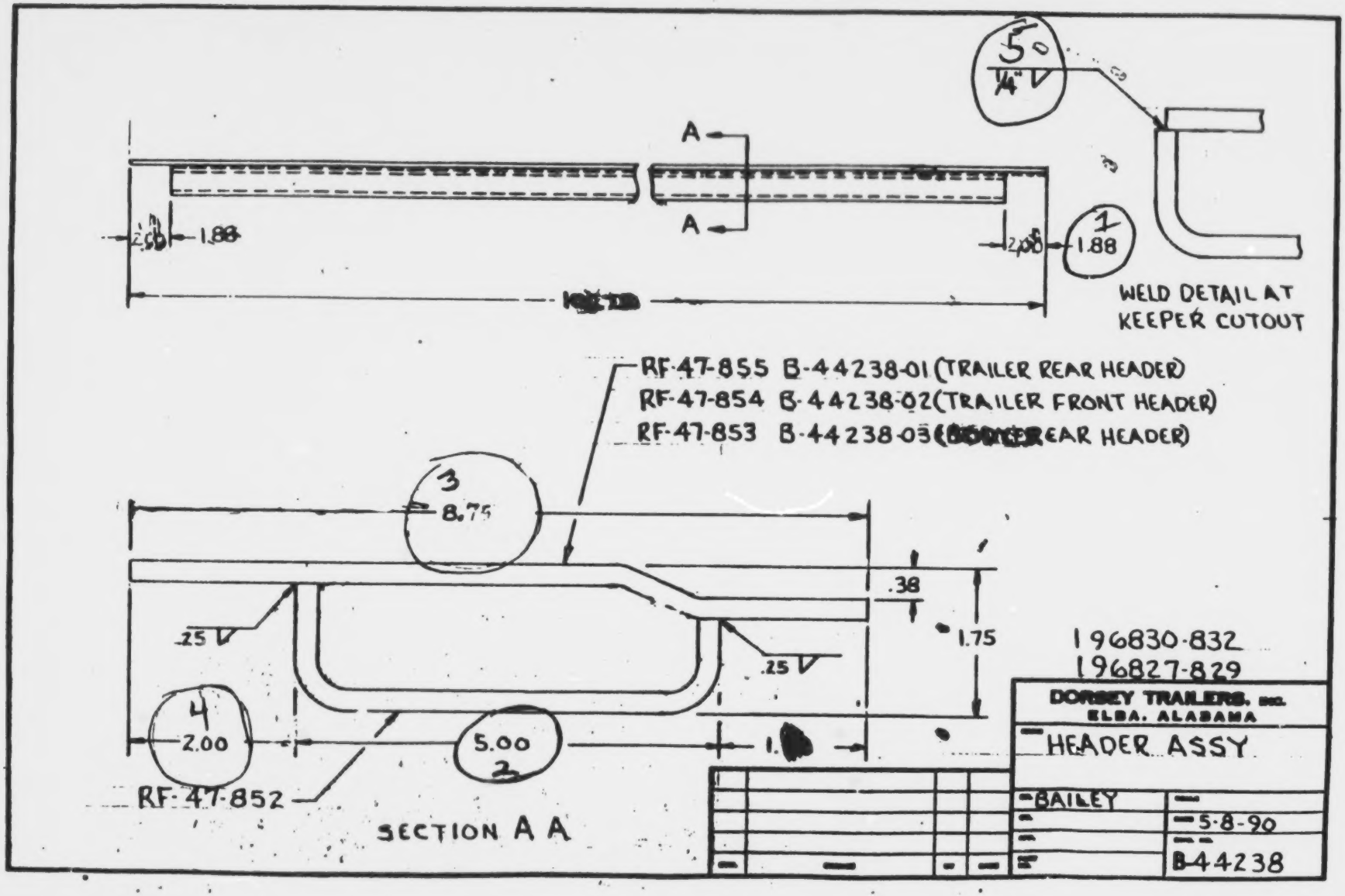
2. Refer to ② . Express this figure as a percent.

3. Refer to ③ . What is 20% of this number?

4. Refer to ④ . What is 16% of this number?

5. Refer to ⑤ . Express this figure as a percent.

WLDOWEJSPE


5
1/4" V
A
A
1.88
1.88
1
WELD DETAIL AT
KEEPER CUTOUT
RF-47-855 B-44238-01 (TRAILER REAR HEADER)
RF-47-854 B-44238-02 (TRAILER FRONT HEADER)
RF-47-853 B-44238-03 (BOOSTER REAR HEADER)
3
8.75
.38
1.75
.25
.25
4
2.00
5.00
2
RF-47-852
SECTION A A
196830-832
196827-829
DORSEY TRAILERS, INC.
ELBA, ALABAMA
HEADER ASSY
BAILEY
5-8-90
B-44238

Math
Percents
Welder

JOB SIMULATION - DORSEY

Answer Key

1. 188%

2. 500%

3. 1.75

4. .32

5. 25%

WLDOWEJSPE

Math
Percents
Welder

REVIEW - DORSEY

Instructions: Please solve the following problems.

1. What percent of a number is one half of it?

2. Express 3/4 as a percent.

3. Express 1/8 as a percent.

4. Express 1% as a decimal.

5. Express 110% as a decimal.

6. A piece of flat stock is 17 inches long. How long is a piece if it is 18% of the original piece?

7. A piece of flat stock is 20 inches long. How long is a piece if it is 26% of the original piece?

8. A welder's paycheck is $240.00. A deduction of 30% is made for taxes. Find the dollar amount of his taxes.

9. In a mill 10,000 steel plates are sheared. By inspection, 15% of the plates are rejected. Of that amount 6% are scrapped. How many complete steel plates are rejected?

10. How many of the rejected plates are scrapped?

WLDOWEREPE

Math
Percents
Welder

REVIEW - DORSEY

Answer Key

1. 50%

2. .75

3. .125

4. .01

5. 1.10

6. .18 x 17 = 3.06 inches

7. .26 x 20 = 5.2 inches

8. $240.00 x .30 = $72.00

9. 10,000 x .15 = 1500

10. 1500 x .06 = 90

WLDOWEREPE

Math
Measurements
Welder

PREVIEW - DORSEY

Instructions: Please solve the following problems.

Read the distances from the start of this steel tape measure to the numbers on the tape measure. Record your answers.

1.

2.

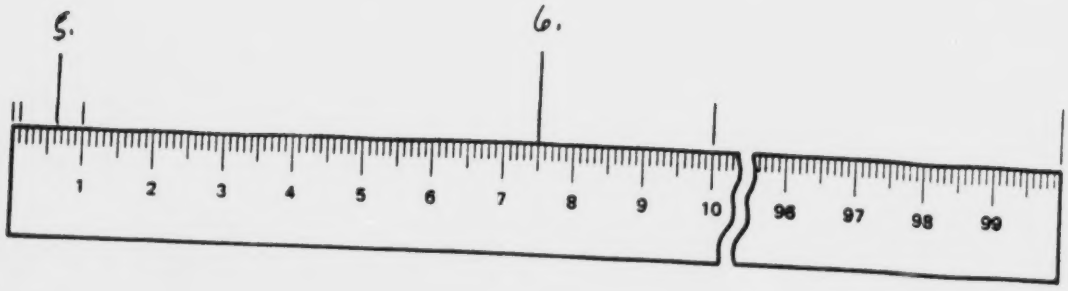
Using a ruler, draw lines of these lengths.

3. 1 3/16 inch

4. 2 5/8 inch

WLDOWEPRME

Read these distances in centimeters from the start of the ruler to the numbers on the ruler. Record your answers.



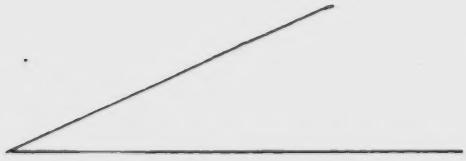
5.

6.

7. You are given a 28 foot length of steel channel. Express this measurement in inches.

8. A fillet weld has 1 meter and 50 centimeters of weld in the joint. Express the total amount of weld in meters.

9. What is the measure of the angle below? (Use a protractor).



10. Using a protractor, draw a 30° angle.

Math
Measurements
Welder

PREVIEW - DORSEY

Answer Key

1. 5/8 inch

2. 3/16 inch

3.

4.

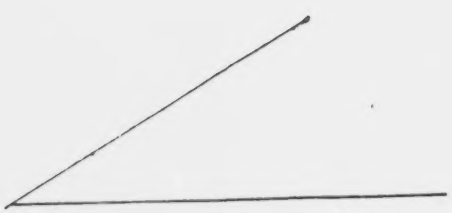
5. 6 mm

6. 7.5 cm.

7. 2 feet 4 inches

8. 1.5 meters

9. 23°

10. 

WLDOWEPRME

Math
Decimals
Welder

REVIEW - DORSEY

Instructions: Please solve the following problems.

1. A piece of I bar is 8 feet 3/8 inches long. Convert this figure to a decimal fraction.

2. A length of channel is 6 3/4 inches long. Convert this number to a decimal fraction.

3. A welded tank holds 23.058 gallons. Round this weight to the hundredths place.

4. A leg fillet weld is 1 1/2 inches long. Convert this fraction to a decimal.

5. Add to find the total weight of three pieces of solid round stock that weigh 13.17625 pounds, 12.3825 pounds, and 14.605 pounds.

6. A piece of square tubing 9 7/8 inches long is sawed from stock measuring 18 3/16 inches. Convert these figures to decimals and subtract to determine the length of the remaining tubing.

7. Thirty-seven pieces of wide-flange beam, each measuring 18.625 feet are needed for a bridge structure. Multiply to find the total footage needed.

8. Multiply 47 by 24.606 cm to find out how much 13.335 cm flat stock is needed to make brackets.

9. Divide to find how many 5.5 gallon containers can be filled from a welded tank that holds 122.375 gallons.

10. Divide to find how many 4.75 gallon containers can be filled from a welded tank that holds 42.75.

WLDOWEREDE

Math
Decimals
Welder

REVIEW - DORSEY

Answer Key

1. 8.375 feet

2. 6.75 inches

3. 23.06 gallons

4. 1.5 inches

5. 40.16375 pounds

6. 18.1875 - 9.875 = 8.3125 inches

7. 689.125 feet

8. 1156.482 cm.

9. 22.25 containers

10. 9 containers

WLDOWEREDE

Math
Measurements
Welder

JOB SIMULATION - DORSEY

Instructions: Please solve the following problems.

1. If a trailer is 96" wide, how many feet wide is it?

2. If a trailer is 102" wide, how many feet wide is it?

3. From arrow tip to arrow tip, what is the actual measurement of line "E (HOLD)" in inches?

4. From arrow tip to arrow tip what is the actual measurement of line "G" in inches?

5. What is the measurement of line "G" in centimeters?

WLDOWEJSME

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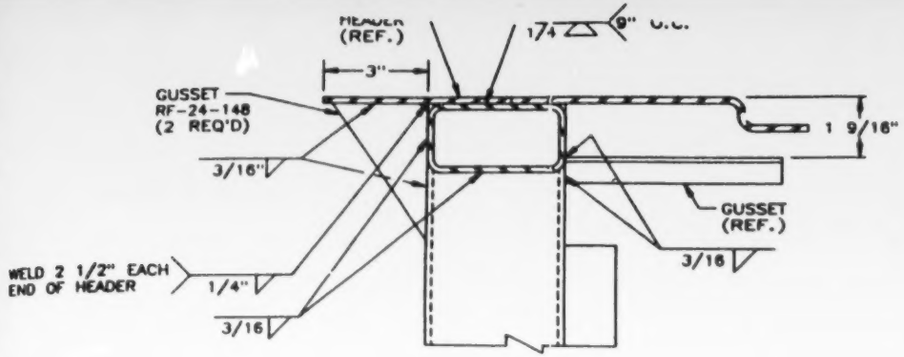
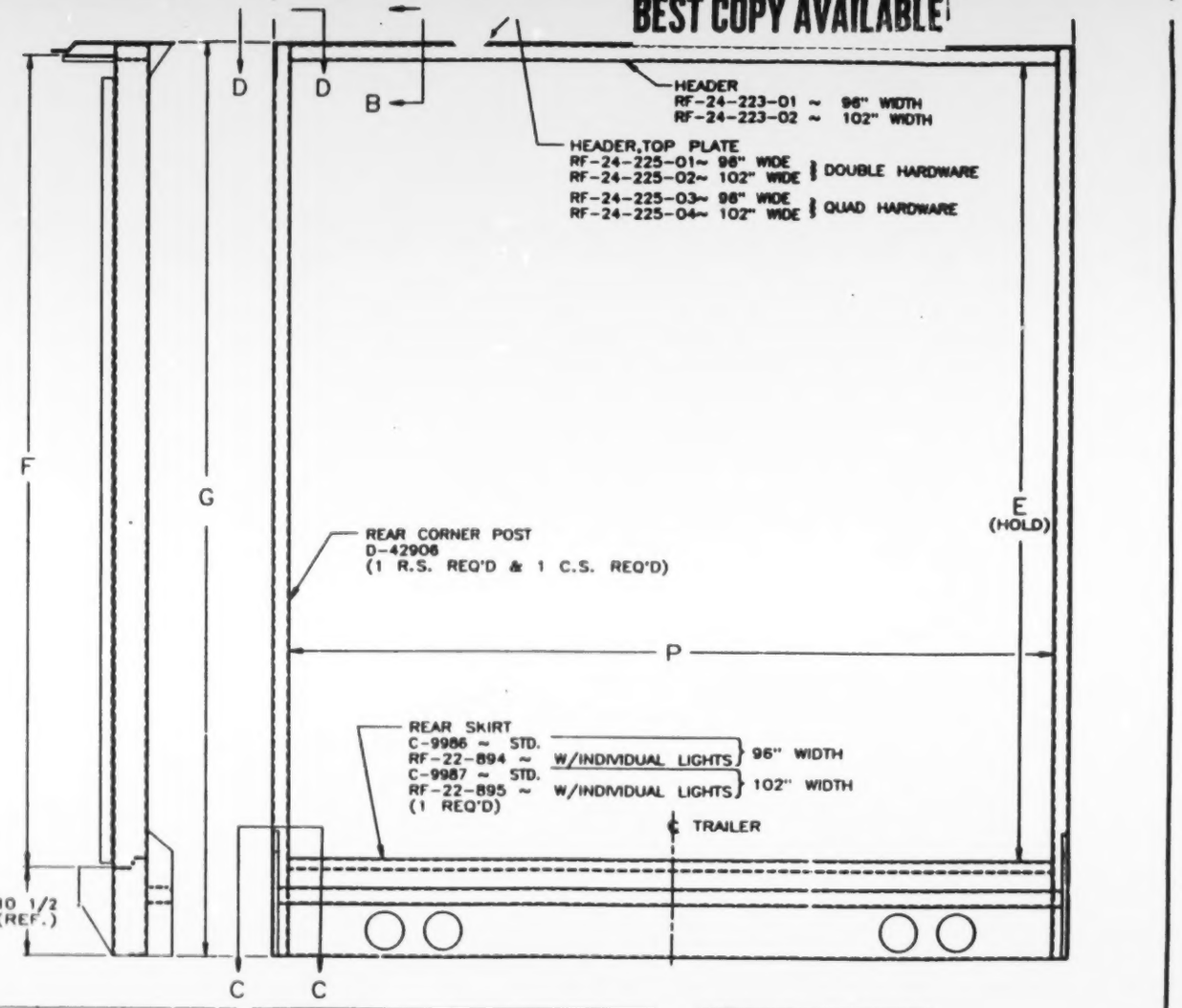


SECTION B-B
SCALE:1/2"=1"



NOTES:

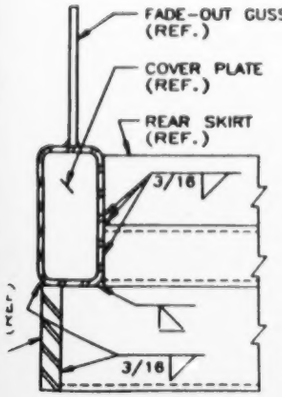
1-SEE DWG. NO. D-42015 FOR UPPER REAR CORNER DETAILS.

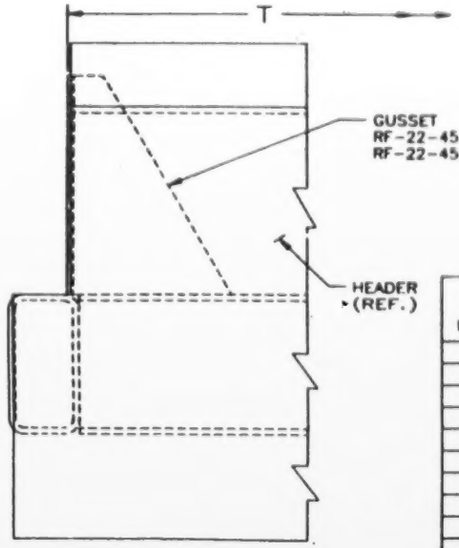
2-SEE DWG. NO. D-41389 FOR LOWER REAR CORNER DETAILS.

3-SEE DWG. NO. D-41858 FOR BUMPER STEP INSTALLATION (WELD ON) USE STAINLESS STEEL VERSION.

4-SEE DWG. NO. D-41856 FOR BUMPER STEP INSTALLATION (BOLT ON) USE STAINLESS STEEL VERSION.

5-SEE DWG. NO. D-40174 FOR LIGHT COVER INSTALLATION.





SIDE POST HEIGHT	E	F	G
95"	95"	96 7/8"	108 15/16"
96"	96"	97 7/8"	109 15/16"
97"	97"	98 7/8"	110 15/16"
98"	98"	99 7/8"	111 15/16"
99"	99"	100 7/8"	112 15/16"
100"	100"	101 7/8"	113 15/16"
101"	101"	102 7/8"	114 15/16"
102"	102"	103 7/8"	115 15/16"
103"	103"	104 7/8"	116 15/16"
104"	104"	105 7/8"	117 15/16"

SIDE POST HEIGTH	E	F	G
107 3/8"	107 3/8"	109 1/4"	121 5/16"
108"	108"	109 7/8"	121 15/16"
108 3/8"	108 3/8"	110 1/4"	122 5/16"
109"	109"	110 7/8"	122 15/16"
109 3/8"	109 3/8"	111 1/4"	123 5/16"
110"	110"	111 7/8"	123 15/16"
110 3/8"	110 3/8"	112 1/4"	124 5/16"
111"	111"	112 7/8"	124 15/16"
111 3/8"	111 3/8"	113 1/4"	125 5/16"
112"	112"	113 7/8"	125 15/16"

TRAILER WIDTH	N	P	T
96"	96"	92"	92 11/16"
102"	102"	98"	98 11/16"

120

121

2 3/16" FLAT HEADER

DORSEY TRAILERS, INC.
ELBA, ALABAMA

REAR FRAME ASS'Y FOR "87" VANS

Math
Measurements
Welder

JOB SIMULATION - DORSEY

Answer Key

1. 8 feet

2. 8 feet 6 inches

3. 5"

4. 5 11/16"

5. 14 centimeters, 7 millimeters or 14.7 cm

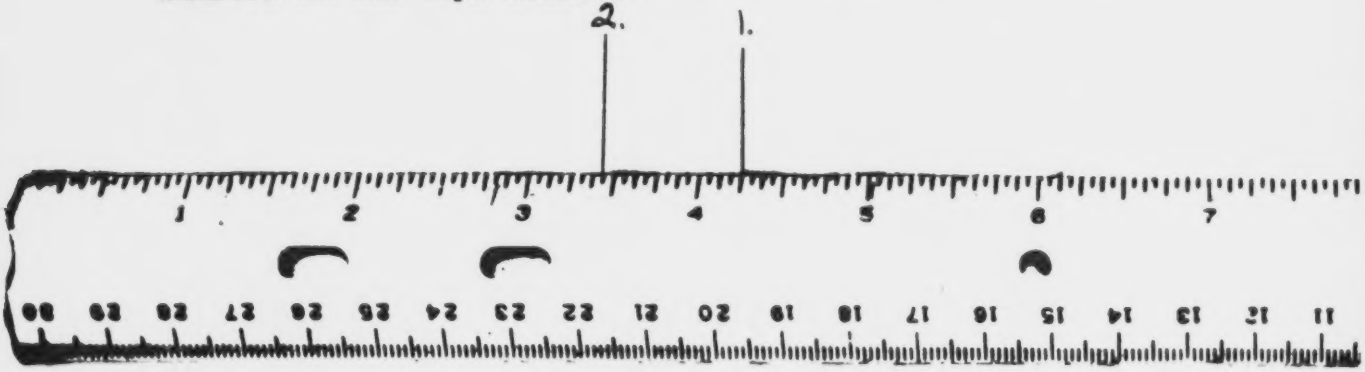
WLDOWEJSME

Math
Measurements
Welder

REVIEW - DORSEY

Instructions: Please solve the following problems.

Read the distances from the start of this steel tape measure to the numbers on the tape measure.



1.

2.

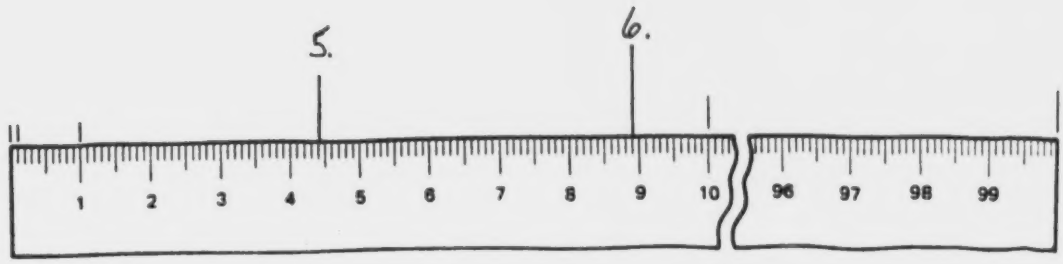
Using a ruler, draw lines of these lengths.

3. 6 1/16 inch

4. 7.5 centimeters

WLDOWEREME

Read these distances in centimeters from the start of the ruler to the numbers on the ruler. Record your answers?



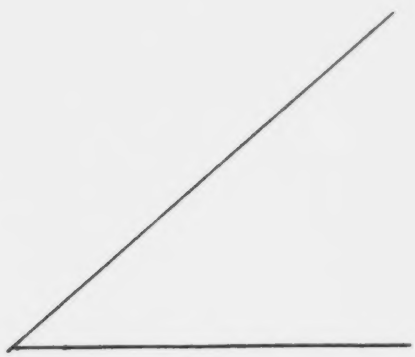
5.

6.

7. You are given a 39 inch length of steel bar. Express this measurement in feet and inches.

8. A fillet weld has 160.02 cm of weld in the joint. Express this measurement in meters.

9. What is the measure of the angle below. (Use a protractor).



10. Using a protractor, draw a 72° angle.

WLDOWEREME

Math
Measurements
Welder

REVIEW - DORSEY

Answer Key

1. 4 1/4"

2. 3 7/16"

3. |——————————————————————————————————————|

4. |——————————————————|

5. 4.4 cm

6. 8.9 cm

7. 3 feet 3 inches

8. 1,6002 meters

9. 40°

10.

WLDOWEREME

Speaking & Listening
Interpersonal Communications
Welder

PREVIEW - DORSEY

Instructions: Compare Chris' welding outfit to the recommended equipment shown below. Then select statements that would give clear simple directions to Chris.

Chris at Work

1. A) "Wear the helmet. It can protect your eyes from blindness."
   B) "There you go being careless again! Don't you know you could get killed?"
   C) "We're dealing with brightness at the 16th magnitude which could lead to retinal detachment."

2. A) "The temperature of a spark from a struck arc exceeds 2000 degrees, which is above the melting point a flesh."
   B) "Gloves protect your hands from 2nd degree burns. Put them on before you light the torch."
   C) "Some people say you are a burnout, but you don't have to prove it."

3. A) "Don't wear sneakers in here."
   B) "Boots protect you feet from hot pieces of metal. Wear them when welding."
   C) "Didn't you read the safety guide?"

WLDOWEPRIC

The following conversations took place between a supervisor and an employee. See if you can pick out the right question for each statement below.

4. "Go to the Supply Department and get some electrodes."

   A) "What time is it?"
   B) "What kind and how many do we need?"
   C) "How do you use an electrode?"

5. "The inspector says our department has a high number of defective welds."

   A) "Can I take a break now?"
   B) "Who is the inspector?"
   C) "What has been the problem with the welds?"

6. "We're getting some new work in bridge construction. We need to get you ready to pass the certification test for bridge welding."

   A) "What must I do to prepare for the test?"
   B) "Who told you about the bridges?"
   C) "Where are the bridges?"

Betty is training a new welder, Chris. Chris has just seen a war movie. He has been using the welding-torch as if it were a flamethrower. Chris doesn't know how hot the equipment gets. Betty must give directions that are clear, simple, and to the point.

Instructions: For numbers 7 through 10 choose the letters of the best examples of clear, simple directions.

   A) "What time are you going to lunch?"
   B) "Chris the flame on the welding torch reaches 5800 degrees."
   C) "That torch can burn and melt anything in here."
   D) "I think we're working overtime this Saturday."
   E) "Aim the torch only at your work pieces."
   F) "What movie did you see last night?"
   G) "Never forget safety procedures."

Speaking & Listening
Interpersonal Communications
Welder

PREVIEW - DORSEY

Answer Key

1. A
2. B
3. B
4. A
5. C
6. A
7. B
8. C
9. E
10. G

WLDOWEPRIC

Speaking & Listening
Interpersonal Communications
Welder

JOB SIMULATION - DORSEY

Instructions: Imagine you are hearing the following safety briefing. Then answer the following questions.

"Machine tools cost from a few hundred dollars to several thousand dollars each. Knowing this you should take pride in your machine and treat it accordingly. A machine in good condition is both pleasant and safe to operate. These are a few rules to observe."

1. "Keep your machine well oiled. It will run smoother and easier, and its life will be prolonged. Always wipe off excess oil."
2. "Be sure the speeds, feeds, and stops are correctly set before starting the machine."
3. "Remove all wrenches and other tools from the danger zone before turning on the power."
4. "Be sure all attachments fit properly."

1. Was the communication clear?
2. Did you avoid daydreaming while listening to the briefing?
3. Did you listen for the main points?
4. If you did not understand something, what should you have done?
5. Were you able to ignore outside, distracting noises?

WLDOWEJSIC

Speaking & Listening
Interpersonal Communications
Welder

JOB SIMULATION - DORSEY

Answer Key

1. Yes

2. Yes

3. Yes

4. Asked a question

5. Yes

WLDOWEJSIC

Speaking & Listening
Interpersonal Communications
Welder

REVIEW - DORSEY

Instructions: Please answer the following questions.

What are the three major parts of the communication process?

1.

2.

3.

4. Name one listening tip you read about in your learning activity.

5. Name one speaking tip you read about in your learning activity.

6. If a set of spoken instructions is not clear to you or does not make sense, what should you do?

The following conversations took place during a welders' job training class. See if you can pick out the right question for each statement below.

7. "This unit will cover identifying electrodes by a number code and a color code and selecting the proper electrode for a specific welding job."

   a) "How many different types of electrodes are there?"
   b) "What time do we go to lunch?"
   c) "Who is that guy?"

8. "The spark test is a method of identifying metals. We will now demonstrate a spark test."

   a) "What exactly should I be looking for?"
   b) "When is this class over?"
   c) "May I catch a ride home with you?"

WLDOWEREIC

9. "There are two types of electric welders, classified according to the current used -- those that provide alternating current (A.C.) and Direct Current (D.C.)."

   a) "Why did you become a welder?"
   b) "Do we get Veterans Day off?"
   c) "When should I use a D.C. welding machine?"

10. "Stock or metal to be welded should be clean and free from rust, paint, grease, and other foreign material."

   a) "What did you have for lunch?"
   b) "What is the best way to clean metal?"
   c) "What time do you get off work?"

Speaking & Listening
Interpersonal Communications
Welder

REVIEW - DORSEY

Answer Key

1. Sender (speaker)

2. Message

3. Receiver (listener)

4. Look at the speaker
   Avoid daydreaming
   Ignore distracting noises
   Ask questions when confused

5. Be clear and brief
   Say what you mean
   Respond to the listeners

6. Ask questions

7. A

8. A

9. C

10. B

WLDOWEREIC

PREVIEW - DORSEY

Instructions: Please answer true if the word is spelled correctly and false if the word is misspelled.

_____ 1. comercial

_____ 2. mashine trades

_____ 3. welder

_____ 4. operator

_____ 5. lath

_____ 6. employer

_____ 7. occupashun

_____ 8. carben

_____ 9. layout

_____ 10. file

_____ 11. solvent

_____ 12. gauge

_____ 13. vize

_____ 14. workpiece

_____ 15. ream

_____ 16. temper

_____ 17. bolt

_____ 18. flamable

_____ 19. sheild

_____ 20. inspection

WLDOWEPRSP

PREVIEW - DORSEY

1. FALSE
2. FALSE
3. TRUE
4. TRUE
5. FALSE
6. TRUE
7. FALSE
8. FALSE
9. TRUE
10. TRUE
11. TRUE
12. TRUE
13. FALSE
14. TRUE
15. TRUE
16. TRUE
17. TRUE
18. FALSE
19. FALSE
20. TRUE

WLDOWEPRSP

Spelling List - Welder

commercial for use in industry

lathe machine for shaping a material by turning it against a cutting tool

machine tool tool used to cut or shape metal

machine trades jobs that involve working with machines

machinist a person who makes, operates, or repairs machines or machine tools

manufacturing making products to sell

operator a person who works a machine

approval permission for work to be done

estimate prediction of how much a job will cost and/or how long it will take

guarantee promise that something will be a certain price or take a certain amount of time

inspection careful examination; checking something to make sure it is correct

labor a task or piece of work; cost of doing the work

clamp device with two jaws that can be tightened to hold things firmly together

chuck device for holding a tool in a machine

punch mark dent or mark in metal that shows where to drill

stop device that checks or controls movement

tap to cut screw threads inside a hole

web flat tip at the drilling end of a drill bit

---

bit cutting tool used in a drill press

drill press machine that cuts holes by rotating a cutting tool

feed to move down or into something

machine to make, shape, or finish using a machine

rotate to turn around a central point

traverse to pass over or across

clamp to hold in place with a special device

filings particles removed by a file

flammable easily set on fire

hazard danger; a cause of danger or harm

shield to protect or guard something or someone with another object

bolt metal pin or rod used for holding things together

bond material that binds or holds together

coarse rough; having large abrasive particles

fine smooth; having small abrasive particles

HS high speed steel

NC National Coarse; NC on a tap means that the number of threads per inch matches the National Coarse thread series

NF National Fine; NF on a tap means that the number of threads per inch matches the National Fine thread series

psi pounds per square inch; the amount of pressure on something

vitrified made with a glassy substance

Al or alum. aluminum; a light, silvery metal

CDS cold drawn steel; steel shaped at room temperature to make it harder and stronger

diam. diameter; the width or thickness of something

face to make or finish a flat surface on a piece of metal

ream to enlarge a hole with a tool

rpm revolutions per minute; the number of times something turns around in one minute

tap tool for cutting screw threads inside a hole; some taps are used with a drill, others are hand tools

temp. temperature

thread ridge running around a screw or bolt

temper to harden and strengthen steel or iron by heating it and then cooling it

abrasive hard material, such as sandpaper, used for grinding and smoothing

carbon element found in all living things; used in steel to make it hard

file metal hand tool with ridged surfaces; used for shaping and smoothing hard surfaces

fluid liquid that can flow

layout drawing or plan showing how to make something or how the parts are arranged

employer person or company you work for or want to work for

occupation a person's job or trade

position a job

qualify to have the skills and training for a job

reference a person who knows you; a person who knows about your work skills

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blade flat cutting part of a saw

burr rough or sharp edge left on metal by a cutting or drilling tool

gauge device for measuring

scribe to mark metal with a pointed tool as a guide for cutting

solvent substance that cleans by dissolving another substance

teeth sharp, pointed parts of a blade or file; teeth cut the metal

vise device with two jaws that holds an object in place while it is being worked on

workpiece piece of work being made or finished using a machine

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Writing
Spelling
Welder

JOB SIMULATION - DORSEY

Instructions: Please read the following job description and identify the misspelled words. Spell the words correctly.

Welder

Performs any welding or burning operations, includeing mig, heliarc, aluminum automatic, or steal automatic welding. Does R & D work related to road testing, stress testing, and preparing specimin and research prototypes. Does general trailor repare work.

WLDOWEJSSP

Writing
Spelling
Welder

JOB SIMULATION - DORSEY

Answer Key

1. including

2. steel

3. specimen

4. repair

5. trailer

REVIEW - DORSEY

Instructions: Please answer true if the word is spelled correctly and false if the word is misspelled.

1. estimate
2. inspectsion
3. labor
4. chuck
5. machine
6. rotate
7. bitt
8. fileings
9. sheild
10. coarsse
11. vitrified
12. diameter
13. gaugge
14. workpeice
15. abrasive
16. lay-out
17. employur
18. referunce
19. manufacturing
20. operater

WLDOWERESP

Writing
Spelling
Welder

REVIEW - DORSEY

Answer Key

1. TRUE
2. FALSE
3. TRUE
4. TRUE
5. TRUE
6. TRUE
7. FALSE
8. FALSE
9. FALSE
10. FALSE
11. TRUE
12. TRUE
13. FALSE
14. FALSE
15. TRUE
16. FALSE
17. FALSE
18. FALSE
19. TRUE
20. FALSE

WLDOWERESP

PREVIEW - DORSEY

Instructions: Pretend that you are Mark Adams and that you need two oxygen cylinders to complete a welding job. You are in the Finishing Department. The order number for oxygen cylinders is FA-1964. What would you write on a requisition form? For each question, select the information that would go in the blanks.

Requisition Form

Purpose: _____ For: _____

_____ Dept: _____

Item:_____ Item No.:_____ Quantity: _____

1. Purpose:

   a. FA-1964
   b. Finishing Department
   c. complete welding job

2. For:

   a. welding
   b. Mark Adams
   c. oxygen

3. Dept:

   a. Finishing Department
   b. Mark Adams
   c. FA-1964

4. Item:

   a. 2
   b. FA-1964
   c. oxygen cylinders

5. Item No.:

   a. 2
   b. FA-1964
   c. oxygen cylinders

6. Quantity:

   a. FA 19-64
   b. oxygen cylinders
   c. 2

WLDOWEPREC

Your name is Mark Sullivan and you work in a weld shop. On October 10th, you are given job number B-2324 asking you to weld a rear door on. You estimate the job will take two hours. For each of the circled numbers on the following form, write the information that should be recorded there.

WORK CODES F = Field M = Machine Shop T = Truck Shop W = Weld Shop	ALABAMA TRACTOR COMPANY 897-5000 FULL SERVICE WORK 393-5000 WORK SHEET & ORDER	
CUSTOMER: ADDRESS: DATE: (9)		JOB NUMBER: (10) EMPLOYEE ASSIGNED: (7) DATE PROMISED:
WORK CODE	DESCRIPTION OF WORK (8)	ESTIMATED HOURS
SIGNED - SUPERVISOR		DATE - JOB COMPLETED

WLDOWEPREC

PREVIEW - DORSEY

Answer Key

1. c
2. b
3. a
4. c
5. b
6. c
7. Mark Sullivan
8. weld rear door on
9. October 10
10. B-2324

WLDOWEPREC

Writing
Effectively Complete Forms
Welder

JOB SIMULATION - DORSEY

Instructions: Please indicate by which circled number you would write the following information.

1. You work in the Rear Frame Department and your name is Chris Cross.

2. You started work on job serial number C-10028 at 10:18 a.m.

3. The job you are working on is serial number C-10028.

4. You quit working on job serial number C-10028 at 11:30.

5. You worked on job serial number C-10028 one hour and twelve minutes.

WLDOWEJSEC

Rear Frame Department Daily Work Sheet

Serial Number	Start Time	Stop Time	Total Time	Employee Name
1	2	3	4	5

Writing
Effectively Complete Forms
Welder

JOB SIMULATION - DORSEY

Answer Key

1. 5

2. 2

3. 1

4. 3

5. 4

WLDOWEJSEC

REVIEW - DORSEY

Instructions: Pretend your name is John Doe. You are ordering new safety glasses for 20 employees that work in your Production Welding Department. The order number is G-4168. For each question, select the information that would go in the blanks.

Requisition			
Dept.: _____		For: _____	
Item: _____	Item No.: _____	Quantity: _____	

1. Dept:

   a. For worker safety
   b. John Doe
   c. Production Welding

2. For:

   a. Production Welding
   b. Welding glasses
   c. John Doe

3. Item No.:

   a. Welding glasses
   b. G-4168
   c. 20

4. Item:

   a. 20
   b. welding glasses
   c. G-4168

5. Quantity:

   a. 20
   b. G-4168
   c. Welding glasses

WLDOWEREEC

Your name is Sam Smith and you work in the welding shop of your company. On October 17th a customer requested that your company prepare some base metal for production. You were given the job on October 18th and it took you four hours to complete. For each of the circled numbers on the following form, write the information that should be recorded there.

WELCO COMPANY 1123 Main Street Easton, AL 36340	WORK SHEET	DATE (8) Phone: 494-8000	
TOOL LIST	OPERATIONS	LABOR LOG	COMMENTS/NOTES
	(9)	Date In / Out Date In / Out Date In / Out Date In / Out Total hours	
WORK DONE BY: (7)		COMPLETED DATE: (6)	TIME: (10)

WLDOWEREEC

REVIEW - DORSEY

Answer Key

1. c
2. c
3. b
4. b
5. a
6. October 18th
7. Sam Smith
8. October 17th
9. prepare base metal
10. 4

WLDOWEREEC

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